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NUMBER ONE

The Corrie Herring Hooks Series

THE BIRD LIFE OF TEXAS



Rovis Agassiz Puertes.

Barn Owl, *Tyto alba*

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1974X
v.1
Birds

The Bird Life of Texas

By Harry C. Oberholser

Paintings by Louis Agassiz Fuertes

*Edited, with distribution maps and additional material, by
Edgar B. Kincaid, Jr.*

With the assistance of Suzanne Winckler and John L. Rowlett

PREFACE BY PAT I. NIXON

FOREWORD BY JOHN W. ALDRICH

VOLUME ONE



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*This book, the first in a series which bears
her name, is dedicated to the memory of
Corrie Herring Hooks
whose love embraced the whole world of nature.*

FOREWORD

In the fall of 1902, two very verdant boys showed up at Brackenridge Hall at the University of Texas. Thinness of purse and unsophistication characterized both boys. B Hall was the logical place for them. A menu, a few years before, had listed coffee at two cents, ham three cents, and sirloin steak four cents.

One of these boys studied law; the other, medicine. For a few years their lives diverged, only to be reunited in San Antonio. The young lawyer was Marrs McLean; the doctor, the author of this foreword.

In 1911, Mrs. Nixon and I were asked to attend a lecture on the birds of Texas at the Menger Hotel in San Antonio. Not much of what the lecturer said has been mentally retained. He is recalled as young, enthusiastic, and capable.

This young ornithologist was Harry C. Oberholser. During the intervening years, many nature lovers, in and out of Texas, have watched with eagerness and hope as his manuscript on the bird life of that state grew in size and the paintings grew in number and beauty.

These Oberholser volumes may well be among the most important ornithological publications since Audubon. It is of interest to note that both Audubons, father and son, visited Texas. In March, 1849, seeking a quicker route through Texas and Mexico to the California gold fields, John Woodhouse Audubon, the son, arrived in Brownsville. Here, disaster in the form of a cholera epidemic overtook him. Ten of his ninety-eight companions died and he barely survived.

The visit of John James Audubon was more auspicious. In his journal, along with notes on the bird life of Texas, he recorded an interview he had with Sam Houston in the town of Houston during the Great Designer's first term as president of the new Republic of Texas. The date was May, 1837:

"We first caught sight of President Houston as he walked from one of the grogshops, where he had been to stop the sale of ardent spirits. He was on his way to his house, and wore a large, gray, coarse hat, and the bulk of his figure reminded me of the appearance of General Hopkins, of Virginia, for, like him, he is upward of six feet high and strong in proportion. But I

observed a scowl in the expression of his eyes that was forbidding and disagreeable. We reached his abode before him, but he soon came, and we were presented to his Excellency. He was dressed in a fancy velvet coat and trousers trimmed with broad gold lace, and around his neck was tied a cravat somewhat in the style of '76. He received us kindly, was desirous of retaining us for a while, and offered us every facility in his power. He at once removed us from the anteroom to his private chamber, which, by the way, was not much cleaner than the former. We were severally introduced by him to the different members of his Cabinet and Staff, and at once asked to drink grog with him which we did, wishing success to the new Republic. Our talk was short, but the impression which was made on our mind at the time by himself, his officers, and the place of his abode can never be forgotten."

Publication of this worthy and beautiful book was made possible by a gift from Verna Hooks (Mrs. Marrs) McLean in honor of her mother, Mrs. Joseph Lamar Hooks. Mrs. Hooks, a lifelong lover and student of nature, heard Dr. Oberholser lecture in Beaumont about the time I heard him in San Antonio. She later furnished many records to Dr. Oberholser for use in his book. Her interest in natural history, especially birds, never flagged.

With a chuckle, she recalled an incident which was a near-approach to the ornithological experience of Telemachus. It will be remembered that, in Greek Mythology, Telemachus was floored by a blow on the head. It seems that eagles of that day were given to flying aloft with a captured tortoise and dropping it on a rock, thus insuring a good meal. One particular eagle mistook the bald head of Telemachus for a barren rock, with disastrous results.

In the case of Mrs. Hooks, she was studying the nesting habits of a group of Great Blue Herons when something fell on her head with a thud. It was a good-sized perch, dropped by a luckless heron!

PAT I. NIXON, M.D.

San Antonio, Texas
1961



Harry Church Oberholser
(1870-1963)

PREFACE

The history of this book began at the turn of the century when the United States Bureau of Biological Survey, forerunner of the U.S. Fish and Wildlife Service, started field investigations in Texas as part of an extensive study of bird and mammal distribution and its relation to the broad life zones of the North American continent. Two young scientists of the Biological Survey, the mammalogist Vernon Bailey and the ornithologist Harry C. Oberholser, were chosen for the Texas investigations. They began their explorations in the Big Bend in 1901 accompanied by the wildlife artist Louis Agassiz Fuertes, who was commissioned to paint the birds and mammals encountered in order to illustrate anticipated published reports. A report on the life zones of Texas, including a detailed account of the mammals with black-and-white reproductions of Fuertes' paintings, was published by Bailey in 1905 as *North American Fauna*, Number 25. It was originally intended that Oberholser's account of the birds be included in this work entitled *Biological Survey of Texas*, but it was decided to delay publication of this until more complete information on the bird life could be obtained. This delay was prophetic of the long history of the project.

As Dr. Oberholser added more and more information to his manuscript, the scope of the work expanded with the author's discoveries in technical ornithology and his unearthing of new sources of information on bird distribution until the naturalist Roy Bedichek was prompted to remark that publication of the results was perhaps an undertaking too big for even the state of Texas. Nevertheless, publication opportunities did arise during the many years that Oberholser was at work on the book, but each time the opportunity was lost by long delays while the author strove to update the information to satisfy himself that it was suitable for release.

In 1941, when Dr. Oberholser retired at the age of 71 from his position as ornithologist with the U.S. Fish and Wildlife Service, the manuscript he had come to call "The Bird Life of Texas" had grown to the staggering proportions of three million words. It encompassed much of the writer's nearly fifty years of findings on the taxonomy of North American birds which

in any way related to Texas. Since about two-thirds of all bird species known to occur in North America north of Mexico have been reported at one time or another in Texas, the opportunities for inclusion of information were great. Oberholser was urged by his ornithological colleagues to publish his taxonomic discoveries currently so the knowledge would be available for others working on those same subjects at that time. But he would not listen to this advice, insisting that everything discovered in connection with his Texas research must go into his book on the birds of that state.

After retirement from government service, Dr. Oberholser continued doggedly with his efforts to bring the manuscript on Texas birds up to date even though prospects of publication became more and more dim. The turning point in the fortunes of this mammoth undertaking came about fifty years after its inception when the Director of the University of Texas Press, Frank H. Wardlaw, became acquainted with it and recognized its possibilities. Mr. Wardlaw believed that there was need for an authentic, comprehensive book on the extensive and varied bird life of Texas, that the interest and resources existed in the state to support it, and that the University of Texas Press offered the most logical medium for producing it. The practical-minded publisher realized at once that drastic reduction of the manuscript would be necessary for the sake of economy, but he believed this could be accomplished without sacrificing either Oberholser's unique original scientific contribution or the Fuertes illustrations.

After a period of unsuccessful search for financial support, the break came. A lecture given by Dr. Oberholser on Texas birds to a Texas audience early in the history of the project bore fruit. The audience included Mrs. Joseph Lamar Hooks of Beaumont, Texas, whose interest in birds was so great that she furnished data to Dr. Oberholser and hoped to see the book eventually published. This interest resulted many years later in the establishment by her daughter, Mrs. Marrs McLean of San Antonio, of the Corrie Herring Hooks Fund at the University of Texas for the publication of "The Bird Life of Texas."

With this encouraging support, Mr. Wardlaw proceeded with plans for preparing the manuscript for publication. To advise him on how this might be done, he selected a committee of ornithologists who were familiar with this project, including Dr. Clarence Cottam, Dr. Robert Selander, and myself. The resulting plan included employment of an ornithologist versed in the current status of Texas birds to assist Dr. Oberholser (then living in Cleveland, Ohio) in condensing and updating the voluminous data. The obvious choice for this position was Edgar B. Kincaid, Jr., of Austin, the most knowledgeable contemporary student of Texas bird life. The objective was to reduce the original three million words to about one million with the retention of essential facts and important scientific contributions. Although naturally disappointed that the work of a lifetime must be abridged, Dr. Oberholser, realizing that this was the only hope for publication, agreed to the plan and proceeded with the task of rewriting the manuscript himself. He continued with this to within a short time before his death on Christmas day, 1963, at the age of 93. Mr. Kincaid was then in full charge of revisions in accordance with guidelines set down by the advisory committee and the director of the Press.

One of the biggest jobs and most important innovations in the treatment of the original data was the conversion of the voluminous Texas distribution records to symbols on maps. This operation alone was responsible for much of the required two-thirds' reduction in the manuscript. Other sections, including the introduction, have been condensed and modernized considerably. However, the two elements considered

by Dr. Oberholser as his most important scientific contributions—the detailed descriptions of plumages and the taxonomic treatment—have been retained. Since the latter resulted in the use of numerous scientific names for genera, species, and subspecies not in current use, the equivalents used in the latest edition (1957) of the American Ornithologists' Union *Checklist of North American Birds* are also given. Thus, *The Bird Life of Texas* in its final form encompasses the results of original unpublished research on the speciation and nomenclature of North American birds by one of America's foremost systematic ornithologists of an earlier period, together with updated information on the status and distribution of all species of birds in Texas by a native son who is the leading student of the subject today. In addition, microfilm copies of the original uncut manuscript have been deposited in the Archives of the University of Texas at Austin and the Library of the Smithsonian Institution in Washington, where they are available to students interested in the detailed information that was not included in the published book.

As a protégé of Dr. Oberholser's during the early years of my career as an ornithologist and later as his successor in the U.S. Fish and Wildlife Service, I am happy to see this satisfactory culmination of his efforts and aspirations which unfortunately he did not live to see himself.

JOHN W. ALDRICH
Research Staff Specialist
U.S. Fish and Wildlife Service

Washington, D.C.
August 9, 1971

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Most of the water colors in this book were painted especially for *The Bird Life of Texas* by Louis Agassiz Fuertes and have not been reproduced before. All the Fuertes paintings and drawings are used with the permission of the U.S. Fish and Wildlife Service.

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Dr. Oberholser studied plumages and distributions of Texas birds in all significant collections in the United States. Among the most helpful were those of the U.S. National Museum (including the Biological Survey specimens) and the large private collection of Dr. Louis Bennett Bishop of Pasadena, California.

EDITOR'S ACKNOWLEDGMENTS

Back in the early 1960's, a distinguished ornithologist said to me, "Mr. Kincaid, I shall be very much surprised if you live to finish editing the Oberholser manuscript." The speaker was merely expressing the prevailing opinion which held that publication of the ponderous *Bird Life of Texas* was impossible.

He was unaware of three remarkable women. Mrs. Marrs McLean generously provided financial aid to cover publication costs. Jo Alys Downs brought to the task of designing this extremely difficult book much more than routine devotion. Suzanne Winckler performed prodigious secretarial and editorial feats, often seven days a week, from late 1969 through 1973.

John L. Rowlett, the other full-time editorial assistant, worked with the senior editor from 1964 to 1971. Chief among his many contributions was his assessment of the current status and distribution of birds in all parts of the Lone Star State; his daily field experience with Texas birds throughout the 1960's fitted him especially for this task.

Three people performed specialized editorial work. G. F. Oatman, Jr., prepared status and distribution accounts for many species, updated records on the species' distribution maps, and edited Oberholser's introduction. Rose Ann Rowlett edited and updated the bibliography—a job which entailed selecting significant works from Oberholser's 572-page list of citations, plus reviewing post-1947 ornithological literature for inclusion of major books and articles in the final version. She also assisted in gathering initial data for distribution maps and later helped update these same maps. F. S. Webster, Jr., read and criticized the entire manuscript.

Two persons helped expedite editorial tasks. From late 1961 until mid-1964, Carolyn Sue Coker retyped portions of the Oberholser manuscript. Kathleen Jordan was chiefly responsible for converting Oberholser's original inch measurements into millimeters.

In the early 1960's, Anne LeSassier gathered and transferred several thousand bird records to the first version of the distribution maps used in this book. She also traveled at her own expense to the U.S. Fish and Wildlife Service in Washington, D.C., to urge that the maps be published.

John W. Aldrich of the U.S. Fish and Wildlife Service—which owns the Oberholser manuscript and the Fuertes paintings—was an active participant in and supporter of the project from the beginning, representing the Service in all matters concerning it. In addition, Dr. Aldrich prepared for publication the account of the Canada Goose complex.

At the U.S. Fish and Wildlife Service, Mary W. Mann constructed the third and final set of distribution maps. Blanche Mahlman typed the preliminary version of the manuscript; Shirley J. Artis typed the final version.

Ornithologists of the U.S. Fish and Wildlife Service,

the U.S. National Museum, and the National Park Service aided greatly in the authentication of many Texas bird records.

During the early 1960's, editorial operations were assisted by grants from the National Science Foundation.

Too numerous to list here are the Texas ornithologists and birders who provided their records at various times during the course of editing and updating the manuscript. However, during the last four years of the project, numerous persons were called upon regularly for their help. They include: K. A. Arnold, J. C. Arvin, G. W. Blacklock, Clarence Cottam, V. L. Emanuel, T. B. Feltner, C. D. Fisher, F. R. Gehlbach, G. A. Newman, Hazel B. Nichols, Noel Pettingell, D. N. Russell, W. A. Shifflett, David and Winifred Simon, R. H. Wauer, F. S. Webster, Jr., and Frances Williams.

Even the 1901 Fuertes water colors received special treatment. Roger Tory Peterson restored the male Vermilion Flycatcher from a deeply faded salmon pink to its natural red. Bob Jones and his staff at Hart

Graphics, Incorporated, in Austin took special interest in the faithful reproduction of the Fuertes originals.

During the spring of 1972, Bob Rodrigues helped review ornithological literature for updating the bibliography.

In the waning days of 1973, Holly Carver, U.T. Press proof reader, as well as Gus and Carolyn Grosskopf and the staff at G & S Typesetters were of great assistance to Ms. Winckler and myself.

To all of the foregoing bird people, to scores of contributors unnamed in this acknowledgment, and also to the hundreds who aided Dr. Oberholser, the senior editor expresses his whole-hearted thanks.

Finally, E. B. Kincaid, Jr., deeply appreciates Bertha McKee Dobie, Lucile McKee Kincaid, Aileen Fenley Mundy, and Dorothy Cooper Hartshorne. Without their very real but immeasurable contributions, Oberholser's *Bird Life of Texas* would never have seen the light of day.

EDITOR'S INTRODUCTION

PURPOSE

The purpose of *The Bird Life of Texas* by Harry Church Oberholser (1870–1963) is to give a detailed history and natural history of all the species and subspecies of indigenous birds which have occurred within the confines of the present (1973) state of Texas from the date of the first recorded bird observation in late summer of 1535 through the winter season of 1972–73 (ending February 28, 1973); a few observations made after this date which supplied significant data to the status of species were included through June, 1973. Naturalized birds (i.e., introduced species breeding freely in the wild for ten years or more) are also discussed in detail. The California Condor and Black-billed Magpie are included on the bases of prehistoric bones.

A by no means secondary purpose is to publish works by the celebrated American bird artist, Louis Agassiz Fuertes (1874–1927). During the course of writing *The Bird Life of Texas*, H. C. Oberholser made many trips to Texas to investigate its birds, but his bird and mammal collecting trip to the Big Bend in 1901 with Vernon Bailey and L. A. Fuertes was certainly the highlight of the author's career. It was during and just after this Big Bend expedition that Fuertes painted many of the birds that appear in this book; most of the water-color paintings are reproduced here for the first time.

ORGANIZATION OF TEXT

H. C. Oberholser worked on the manuscript of *The Bird Life of Texas* from 1900 until he died on Christmas day, 1963. The senior editor, Edgar B. Kincaid, Jr.—greatly assisted by junior editors John L. Rowlett and Suzanne Winckler—has trimmed, reorganized, and updated the text. One accomplishment was the reduction of Oberholser's manuscript of 11,754 typed pages by two-thirds. Only two parts of Oberholser's original 961-page introduction are included in the text—The History of Texas Ornithology and The Ecology of Texas Birds. The latter has been extensively reorganized, with the inclusion of additional material,

especially in the vegetation section. Two major organization changes have been made with regard to species treatment: (1) the species replaces the subspecies as the basic unit; and (2) each bird is now treated at two levels—the species (SPECIES ACCOUNT) and the subspecies or population (DETAILED ACCOUNT). The species account section has been vigorously edited with infusion of much new data, whereas the detailed account section is almost exactly as Oberholser left it. However, at the request of Dr. John W. Aldrich, U.S. Fish and Wildlife Service advisor for this book, technical nomenclature used throughout is strictly that of Dr. Oberholser. No post-Oberholser (1963) common names are used in this book.

Texas Bird List

The first task confronting an author and editor of a state bird book is to determine which birds should be included. With a few exceptions, species admitted in good standing to *The Bird Life of Texas* have passed the specimen or photograph test. That is, proof of occurrence has been verified by a correctly identified and preserved specimen or photograph representing a wild bird taken without doubt in Texas. After a species is thus documented, further records, including valid sight records (i.e., those made by one or more experienced observers), are accepted. All subspecies records are based on collected birds, most of which were personally examined, measured, and identified by H. C. Oberholser. Specimens certified by Dr. Oberholser, with tags initialed "HCO" attached, are located in bird collections throughout the United States and Canada. (For a list of bird collections in the United States and Canada, see Richard C. Banks, et al., 1973, *Auk* 90: 136–170.)

Four species—Wilson's Petrel, Broad-billed Hummingbird, Coppery-tailed Trogon, and Lawrence's Goldfinch—are admitted in good standing without preserved specimen or photographic evidence; these are fairly easily identified birds which have been encountered in various years by highly experienced observers. Two less easily diagnosed species—Trumpeter Swan and Rieffer's Hummingbird—are accepted; Tex-

as records of both are included in the American Ornithologists' Union *Check-list of North American Birds*, fifth edition, 1957.

With the exceptions noted, species whose occurrence in the Lone Star State rests solely on sight records are designated *Hypothetical*, treated briefly, and enclosed in brackets.

Two species each with a Texas specimen record—Paint-billed Crake, Antillean Crested Hummingbird—and one taken alive from a mist net—Orange-breasted Bunting—have, after careful consideration, been treated as hypotheticals due to the high likelihood of their being escaped cage birds.

Birds (either species or subspecies) mentioned in published record as having been seen or taken in Texas, but whose actual occurrence as wild birds is virtually 100 percent unlikely, are consigned to Appendix C (Birds Mistakenly Attributed to Texas).

The number of bird species in good standing in *The Bird Life of Texas* is 545. Of these, 331 species are known to have either nested, or attempted to nest, at least once within the state. Had the nomenclature of the A.O.U. check-list, 1957, been used, there would be 540 occurring species, of which 330 would have nested. The following species probably have bred in Texas, but specific details of nesting are lacking: Green-winged Teal, California Condor, Virginia Rail, Sora Rail, Upland Plover, Passenger Pigeon, Carolina Parakeet, Spotted Owl, Blue-throated Hummingbird, Yellow-bellied Sapsucker, Dusky Flycatcher, Gray-breasted Martin, Sage Thrasher, and Black-throated Gray Warbler. Hypothetical species in this book come to 50. Had A.O.U. nomenclature been used, this number would remain at 50. Subspecies totals appear at the beginning of the detailed account section under each species; there is no grand total for the book. (Readers undertaking such a count should be impressed. Oberholser recorded 20 subspecies of Yellow-throat in Texas!)

Treatment of Species

First name mentioned in a heading is a common American English bird name, usually the one appearing in the A.O.U. check-list, 1957. Next comes Oberholser's technical name; very frequently this differs from the A.O.U. technical name.

SPECIES ACCOUNT

The purpose of the first paragraph of this account is to establish at the outset the identity of the bird under discussion. First comes the A.O.U. technical name if it is different from the name in the species heading. In this situation, the reader is referred immediately to Appendix A (Nomenclature) in which Oberholser discusses his reasons for differing from the A.O.U. Follow-

ing the A.O.U. name are: alternate English names widespread in literature, if any; a brief description of the bird, that should be useful in field observation; average total length in inches; average wingspan in inches (feet if 36 inches or more); and average weight in ounces (pounds if 16 ounces or more).

RANGE: This is world distribution of the species as a whole. Breeding range is given first. Geographically, it reads from northwest to northeast, south to southwest thence to southeast. Winter range is then sketched in the same manner.

TEXAS: This section covers status and distribution within Texas. For species with ten or more valid records, the reader is referred immediately to a distribution map (see **RANGE MAP** section below). Then follows a seasonal analysis. In delineating distribution and evaluating status of a species, the region of greatest abundance is stated first, followed by regions where the species becomes relatively less abundant. The major ornithological regions and significant localities of Texas used in this book are shown on the maps on pages xxii and xxiii.

Resident or Breeding: If a bird nests or has nested in Texas, the breeding months are given (and in parentheses the dates upon which eggs and/or nestlings have been found, or pertinent nesting activity observed). Altitudinal breeding range, expressed in feet above sea level, is also stated. Following this is an appraisal of the species' abundance as a breeder.

Migration and/or Winter: For a bird which migrates and/or winters in Texas, a span of months is given under either seasonal category in which the species regularly occurs in the state (with extreme dates on record in parentheses). Then follows an account of status and distribution. (N.B.: In the span of months, the word "to" has been used to mean "to and including." Thus, for example, the span "Mid-Mar. to June" defines a period from about Mar. 15 through June 30.)

Occurrences beyond areas of regular distribution are usually mentioned, with details, after the normal range has been delimited. Where appropriate, such information is listed under *Dispersal* or *Vagrant*. The dispersal category is reserved chiefly for species, such as herons and egrets, which exhibit a regular postnuptial wandering period. The vagrant class is applied mainly to unpredictable or irruption-prone species, for example the Pinyon Jay and Evening Grosbeak.

If records in breeding or other categories are very few, individual occurrences are related in detail and ordinarily an abundance appraisal is not made. Also, recent nestings of declining species of large water birds and Falconiformes are given in some detail. Former status is often given for species which have undergone marked changes within the state; this is a clue to the reader that a **CHANGES** section follows which elabo-

rates on the factors that may be involved in a species' change. Also, restocked areas, if any, are mentioned in the TEXAS section.

The terms used in this book to indicate numbers of individuals are defined in the table below.

RANGE MAP: *The Bird Life of Texas* manuscript was originally accompanied by a number of shaded state distribution maps each of which showed only one kind

of information; for example, the summer range of the Yellow-crowned Night Heron. The bird was either present or absent in the portion of the state and in the season indicated. Real species ranges, however, seldom exhibit this all-or-nothing situation; there is usually a fading or lessening of individual numbers as the limits of distribution are approached.

Because of this drawback, none of the original range

ABUNDANCE SCALE	
The terms below are based on the number of individual birds that might be counted by one experienced observer operating in suitable habitat within a fifteen-mile-diameter circle during one day—i.e., twenty-four hours (unless other time unit is specified). Note that sometimes figures in one category overlap those in the next category. Overlap is necessary to accommodate solitary and flocking species, the latter being more easily seen and counted. For example, 10 Great Horned Owls would make the species common; however, 10 White Pelicans would classify as only fairly common.	
Abundant:	More than 500 individuals of a species per day.
Very common:	25 to 500 per day.
Common:	10 to 100 per day.
Fairly common:	Normally 5 to 25 per day or several groups a day; expected but could be missed.
Uncommon:	Less than 5 per day or no more than 1 group a day; easily missed but expected over several days.
Scarce:	1 to 5 per season or year or 1 group a season or year; probably regular (unless otherwise stated) but very easily missed though expected over several seasons or years.
Rare:	1 to 5 records of individuals or groups per decade on regional level (e.g., Trans-Pecos, upper coast); not to be expected. (N.B.: The terms “very” and “extremely” are sparingly used with scarce and rare. These modifiers indicate that a status should be interpreted to mean the lower end of a span of numbers of records. That is, “very rare” or “extremely rare” would indicate 1 or 2 records per decade as opposed to 4 or 5.)
Casual:	2 to 5 records for a region or 6 to 15 records on a state level (from available records for the 19th and 20th centuries).
Accidental:	Only 1 record on a regional level or only 1 to 5 records on a state level; not reasonably expected to occur again at local level (e.g., county).
Irregular:	Erratic and unpredictable in occurrence; also often applied to irruption-prone species (e.g., Goshawk, Pinyon Jay).
Local:	Not generally distributed throughout a region; instead, occurring in small areas within a larger region, often as a result of fragmented habitat.

ORNITHOLOGICAL REGIONS OF TEXAS*

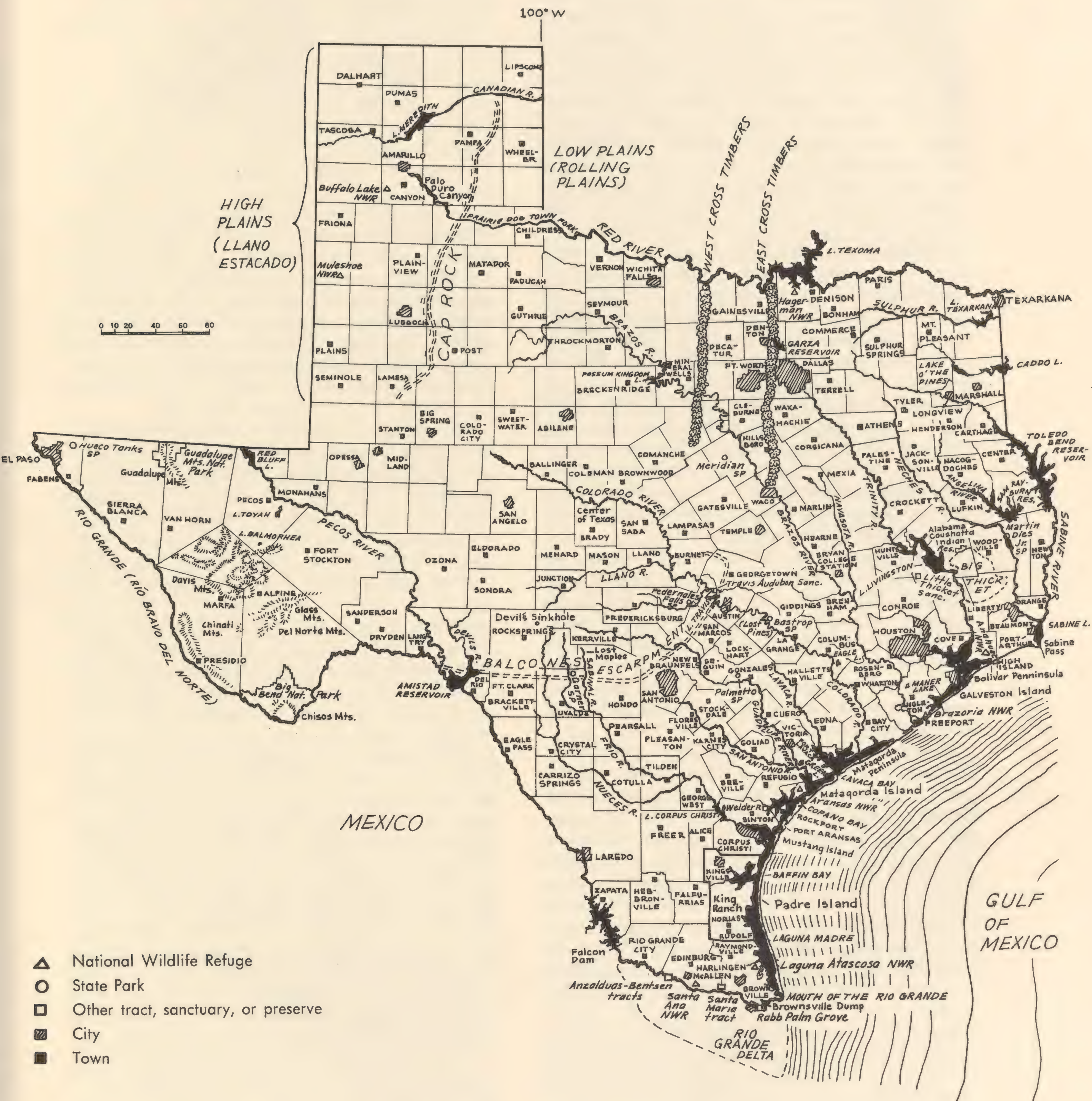


1. Panhandle
 - a. northern
 - b. middle
 - c. southern
2. North Central
3. Wooded Eastern Quarter
4. Trans-Pecos
5. Edwards Plateau
6. Central Prairie
7. South Texas Brush Country
8. Coastal Prairie
 - a. upper coast
 - b. central coast
 - c. lower coast

X=Center of Texas (McCulloch County)

*Adapted from the Texas Ornithological Society

SIGNIFICANT ORNITHOLOGICAL LOCALITIES IN TEXAS



maps has been used. The senior editor in 1961 decided to plot individual locality records of each bird from the Oberholser manuscript onto large outline maps which showed the 254 Texas counties. First chore was to assign counties to the several thousand cities, towns, settlements, ranches, creeks, etc., mentioned in the manuscript. Dr. Oberholser's 353-page typed Gazetteer of Texas was an essential help in this task. After the plotting of thousands of records, it was apparent that past and present ornithologists and bird finders had concentrated on only a few favorite regions—Fort Worth–Dallas, Austin, San Antonio, Houston–Galveston, Corpus Christi–Rockport, Big Bend, and the Rio Grande delta—leaving large blocks of counties almost untouched. Accordingly, the senior editor and his associates—chiefly Ruth Black, Bertha McKee Dobie, Carolyn Sue Coker, V. L. Emanuel, Frances Gillotti, Anne LeSassier, G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett, and Dan Scurlock—drove, alone or in parties, some 400,000 miles in the 243 under-birded counties, gathering records to fill in blank spaces on the maps. These journeys were in all seasons but were more frequent in spring and summer. A sharp lookout was kept for signs of avian breeding activity, such as active or old nests, fledglings squealing to be fed, and adults carrying food or nesting material.

To the thousands of bird sightings from these trips were added additional thousands of reports from *Audubon Field Notes* (now *American Birds*), the *Spoonbill* (newsletter of Ornithology Group, Houston Outdoor Nature Club), and many published and unpublished local and regional check-lists. Records were also mapped from specimen lists of chief bird collections in Texas and in the U.S. National Museum (now the National Museum of Natural History).

As now published, each bird with a specimen or photograph and at least nine other valid Texas records has a map showing its distribution within the state. Exceptions are the two extinct species (Passenger Pigeon, Carolina Parakeet), one virtually extinct species (Ivory-billed Woodpecker), and two incompletely naturalized introductions (various subspecies of Ring-necked Pheasant, Rock Dove). With historic species, the problem of separating specimen records from reports of hunters proved insurmountable; likewise, the two aliens were not mapped because of the difficulty of distinguishing between wild and domesticated individuals.

Breeding ranges and seasonal distribution are indicated by means of five symbols, explained in a legend on each map. For mapping purposes, the seasons have been defined in the chart that follows.

Arbitrary limits have not been set for the breeding season since that period varies with species. However, with the exception of large hawks and owls, most

Season	Months
Spring	March–May
Summer	June–August
Fall	September–November
Winter	December–February

Texas species nest and rear young in spring and summer.

On the subspecies level, only breeding ranges are delimited, since migrants and winter residents of several races typically intermingle. For species having two or more breeding races in the state, boundary lines are drawn to mark approximate limits of breeding ranges. If only one subspecies nests in Texas no boundary lines are marked. Symbols representing migrants, winter residents, and even summer birds of races other than a nesting race are often frequent within the breeding range of that race as shown on the map.

Even though it is impossible to show how many actual records of a species have been made in each county, a rough idea of relative abundance is conveyed by the symbols. A bird is likely to be numerous in portions of the state where its symbols are closely clumped; it is likely to be sparse where the symbols are widely spaced. In the final map version, the majority of Texas counties have room for only two symbols; the large Trans-Pecos counties as well as Webb County are ordinarily, like the rest of the state, given no more than two symbols per county. This arrangement has resulted in an unusual amount of space between symbols in the Trans-Pecos and in Webb County; coincidentally, however, this land is arid, causing bushes and birds to be rather far apart.

With counties where multiple records were available it was necessary to select the two symbols that best indicate a species' true status. This the senior editor has done on the basis of his 45 years of observing birds in Texas. For example, in Travis County the Mockingbird, a permanent resident, has nesting, spring, summer, fall, and winter records. The nesting and wintering symbols best show this bird's resident status; therefore, these are the two activities represented in Travis County on the map. Had no actual breeding record been available for the county, summer and winter symbols would have been used. The distinction between specimens (solid black symbols) and sightings (outline symbols) is apparent on every range map.

HAUNTS AND HABITS: The purpose of this section is to state in some detail the habitat and behavior of the species, especially in Texas. The nest of each non-Texan breeder is also briefly described here. If the bird is the first (on the Texas list) of its family, the number of species in the family on a world basis is given.

These figures are those of Ernst Mayr and Dean Amadon (April 2, 1951, *American Museum of Natural History Novitates*) unless otherwise stated. If a bird has an especially noteworthy attribute, this is often mentioned. For example, the Golden-cheeked Warbler is the only generally recognized full species of bird whose nesting range is entirely confined within Texas.

Manner of flight, response to observers, foraging behavior, food, and voice are standard topics in the habits portion. For passerine birds, type of singing perch and song season are set forth.

CHANGES: Species that rate this section are those which have historically or recently undergone major changes in status or distribution—usually this means a decline. In some instances, as with the Brown Pelican, figures documenting the decline are printed in a table. Gains in bird population are rare and difficult to prove, since every year there are more people counting birds. Nevertheless, the Cattle Egret gives every indication of increasing, and figures are offered in documentation.

DETAILED ACCOUNT

This account details each bird at the subspecies level; or, in species with no geographical races, at the general population level. In the heading of this account the number of subspecies which Dr. Oberholser identified in Texas is given. If, according to the author, a bird has no races anywhere in the world the statement NO SUBSPECIES appears in place of the number of races.

Each race is first given an American English name, followed by Oberholser's technical name. In *The Bird Life of Texas*, the racial name is used in conjunction with the species name; for example, California Yellow-billed Cuckoo, rather than California Cuckoo. This editorial style is strictly adhered to, even when it results in a ludicrous name, such as Western Eastern Kingbird.

The A.O.U. subspecies name as listed in the 1957 check-list is given under each race where Oberholser's technical name is different. Also, races not in the A.O.U. check-list, 1957, are so designated. In both instances the reader is referred to Appendix A (Nomenclature) where explanations are made of variance from A.O.U.

DESCRIPTION: Dr. Oberholser's descriptions of birds are exceedingly detailed. To read them one needs a knowledge of bird topography (see illustrations, p. xxvi). Likewise, the reader may require explanation of the color terms used in the descriptions; this is provided in Appendix B (Glossary of Colors).

The usefulness of thorough descriptions of feather colors this late (1973) in the twentieth century may be questioned. According to the American Ornitholo-

gists' Union, there are, as of 1973, over 4,000,000 bird specimens (probably more than half of them from North America) housed in collections in the United States and Canada. Why not examine specimens directly instead of reading their descriptions?

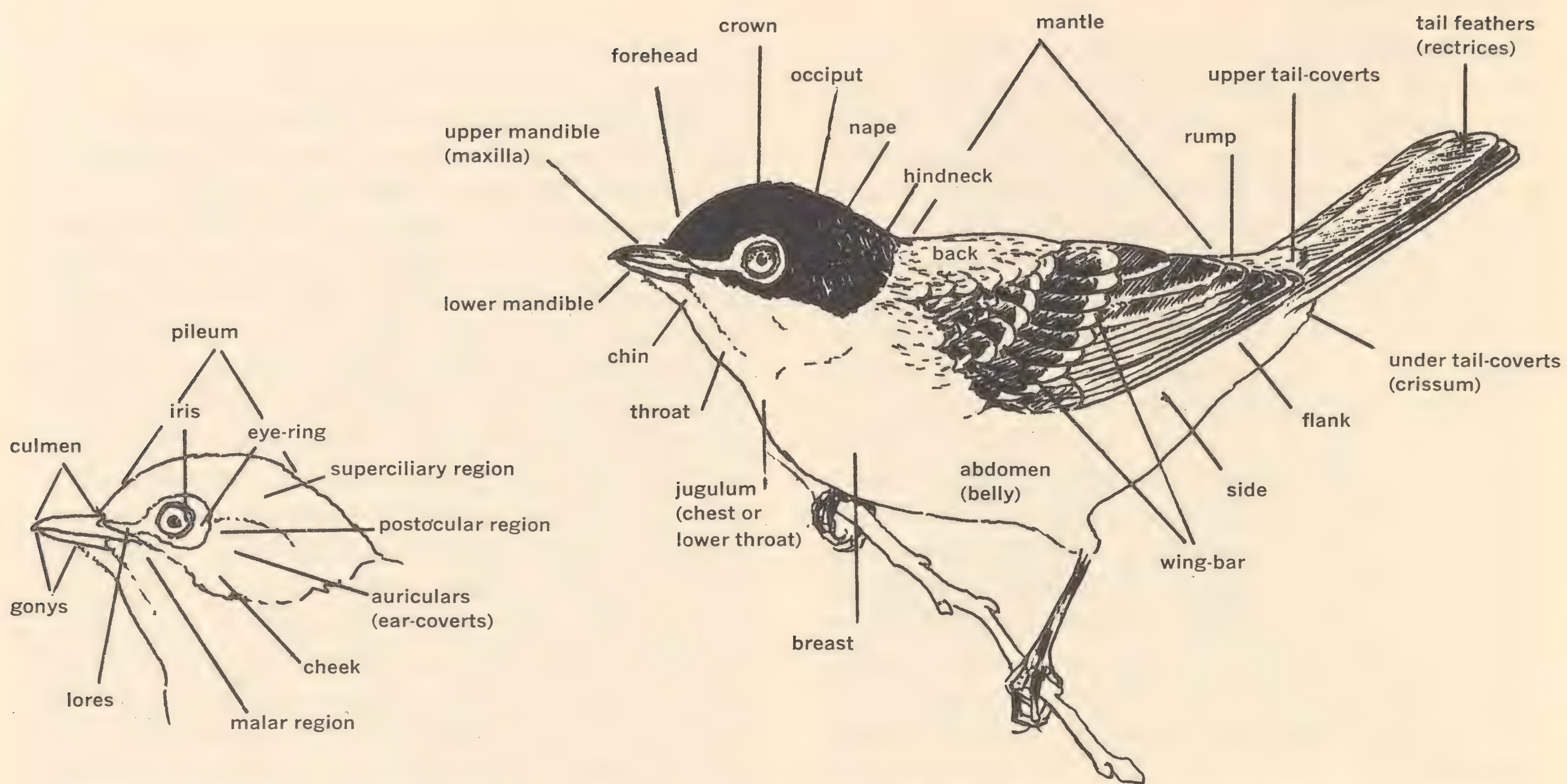
The explanation would seem to be that Oberholser took most of his descriptions from bird study skins early in the twentieth century when they were fresher. Now, more than half a century later, time has corrupted both the feathered and unfeathered parts of these specimens. Even though museum study skins are kept in the dark, feathers gradually fade and fox. Foxing is an oxidation process that converts brown feathers into foxy red ones. Other standard changes are: grays slowly change to browns; blacks and whites each become less so; yellows either darken or pale; reds fade rapidly (e.g., trogon abdomens) or slowly (e.g., Cardinal bodies); Green Jays may become over-blue. Also, preserved skins are subject at all times to destruction by dermestid beetles, clothes moths, other insects, fire, and bombs. For present and future generations of Texans, it would seem that there is ample room for Oberholser's detailed plumage descriptions of Texas birds made from specimens examined in the early twentieth century.

MEASUREMENTS: The detailed measurements were compiled by Oberholser from all available reliable sources; however, a large number were determined by the author himself from preserved specimens and freshly killed birds (see p. xxvii for drawings illustrating the author's method of taking measurements). In the original manuscript the figures were in inches. These have been converted (mostly by Kathleen Jordan) into millimeters (mm.). Avian parts measured are: wing, tail, bill (exposed culmen), height of bill at base, tarsus, and middle toe without claw. In these millimeter measurements, the minimum and maximum for each part are stated, followed by the average in parentheses. The extremes and average were ordinarily derived from a series of at least ten specimens. Overall length has been omitted from the published version since length depends too much upon how the bird's neck was stretched or contracted. However, an average overall length in inches is given under the species account.

RANGE: The world distribution of a subspecies reads from northwest to northeast and from southwest to southeast; this is the same progression used in the world range at the species level.

TEXAS: Detailed distribution of a subspecies or a species with no races is based on collected specimens, which are placed under the appropriate seasonal subheadings—*Breeding, Summer, Migration, Winter*, etc. Within each season that a subspecies or population occurs in Texas, the state is regarded as a clock face

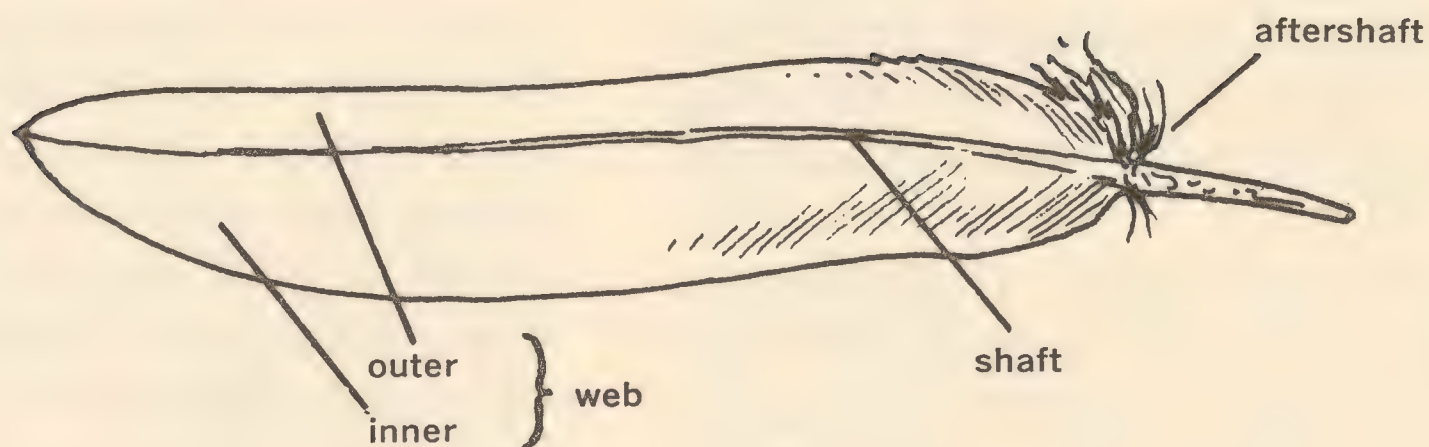
BIRD TOPOGRAPHY



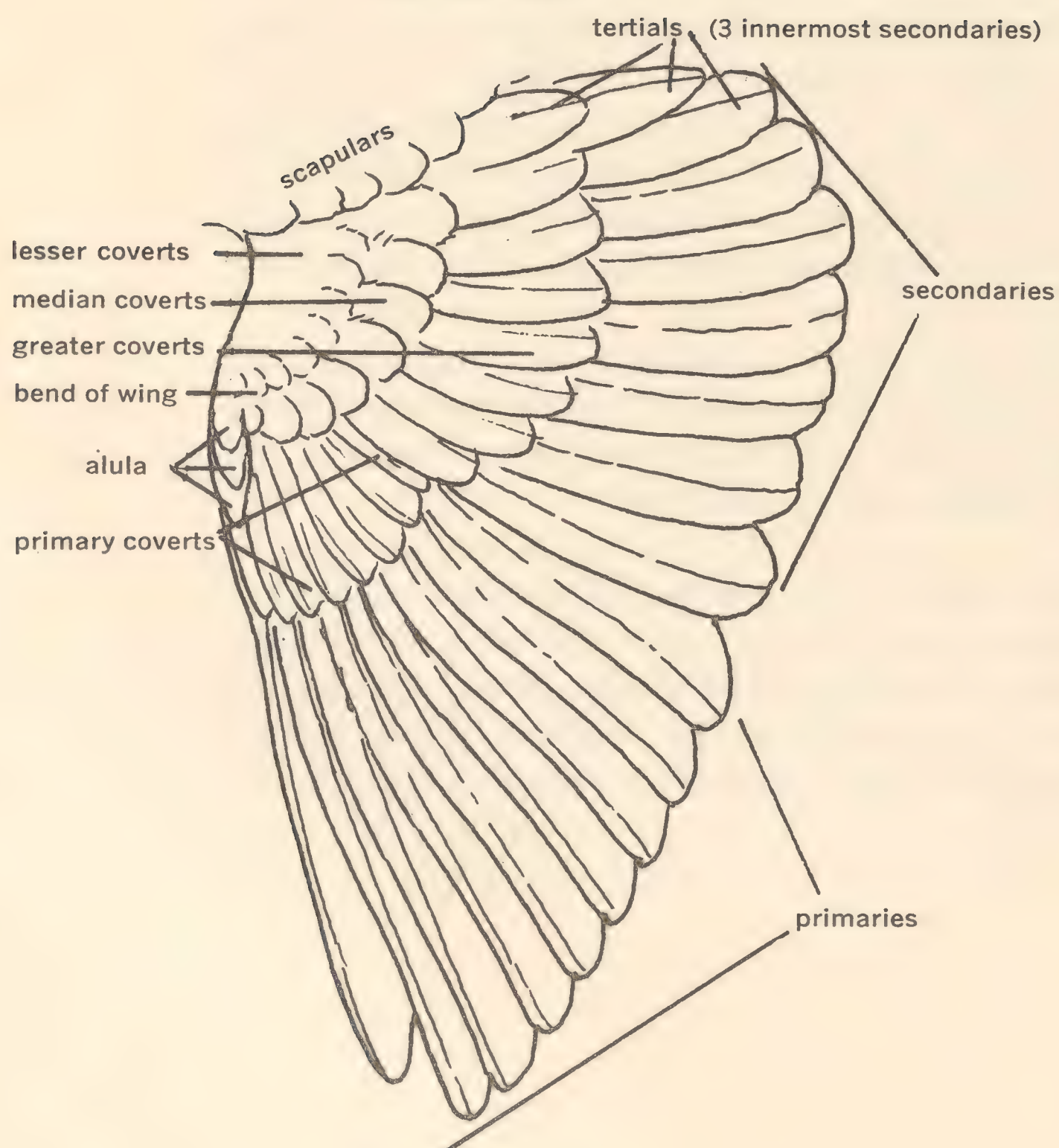
pileum includes forehead, crown, and occiput

mantle includes back, scapulars, and upper wing surface

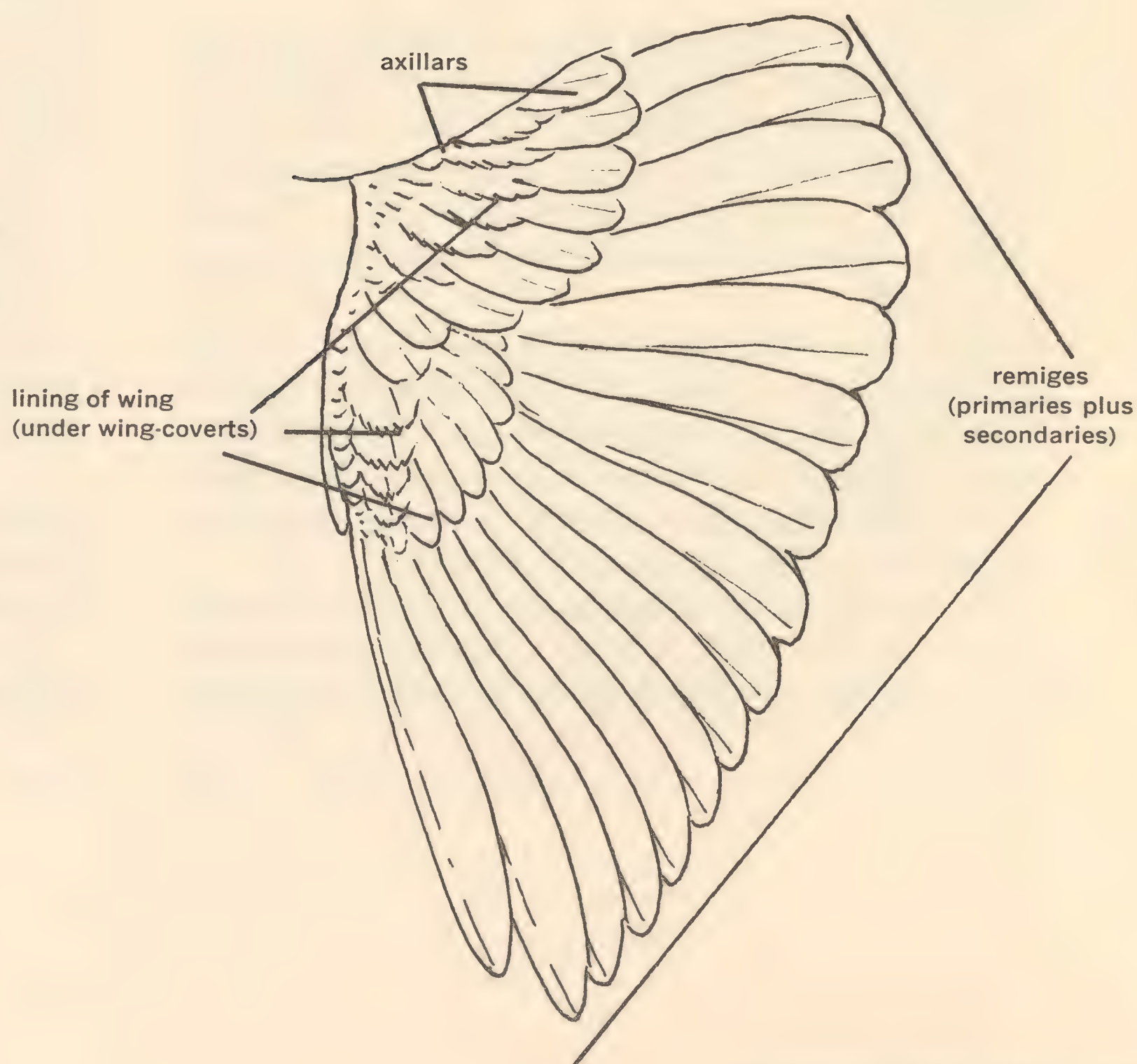
WING-QUILL (flight feather)



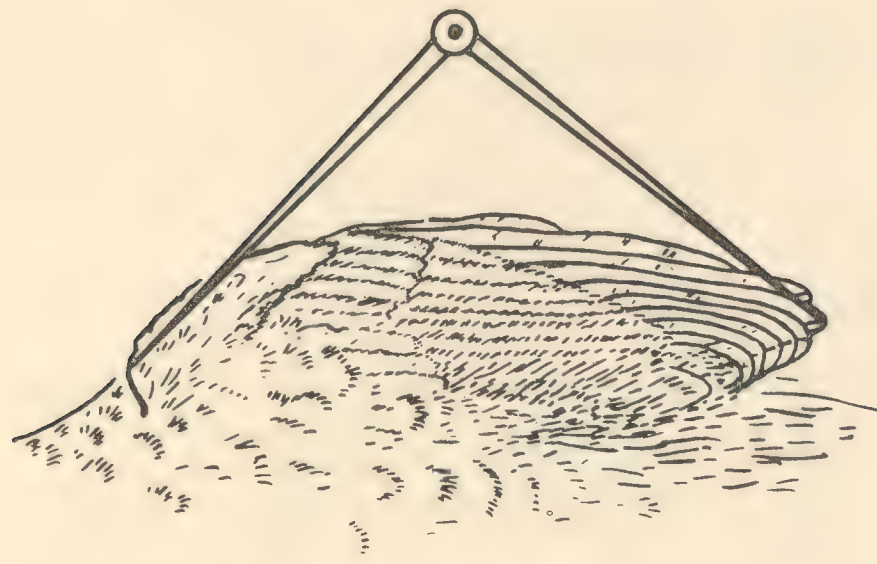
UPPER WING



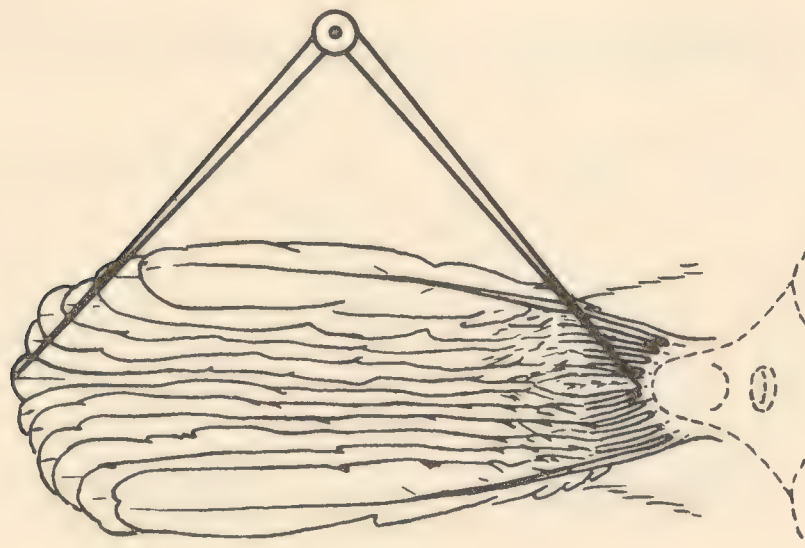
UNDER WING



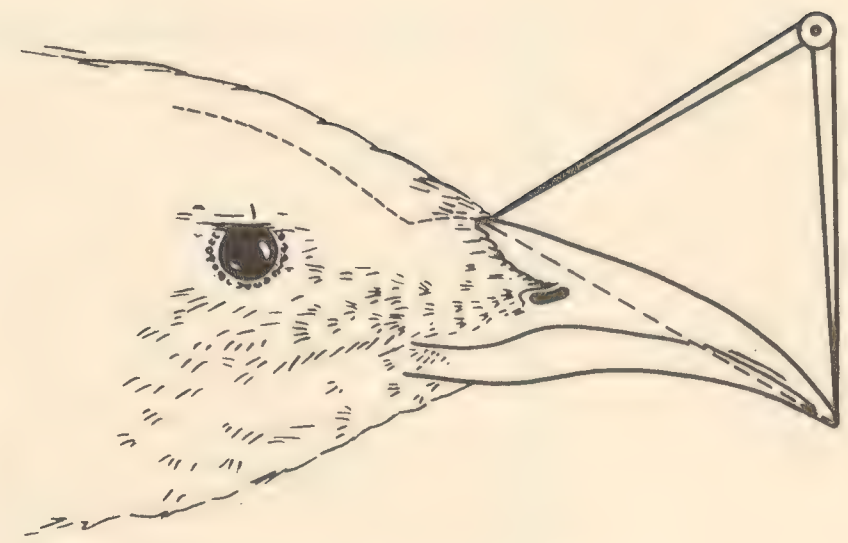
METHOD OF TAKING MEASUREMENTS



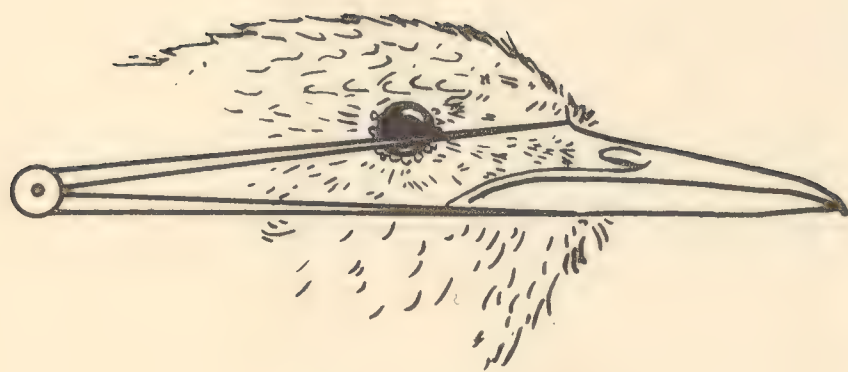
length of wing



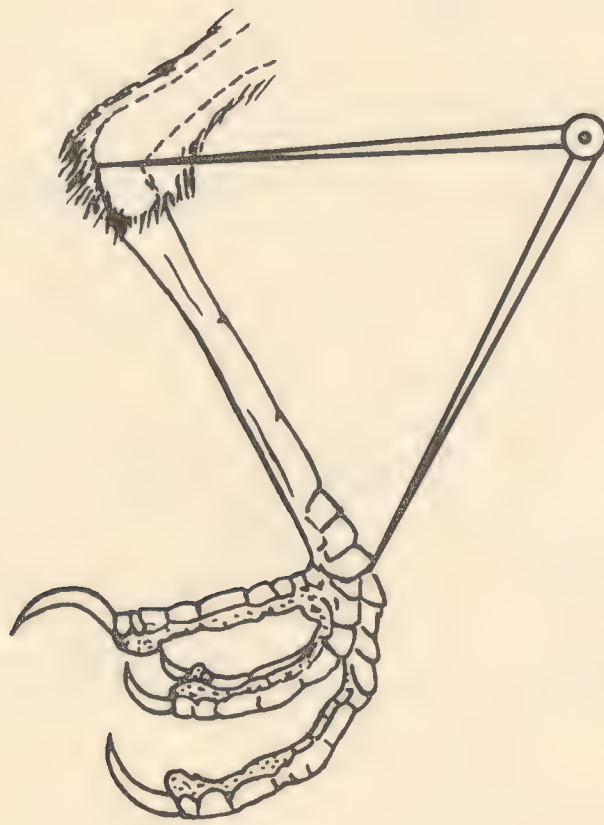
length of tail



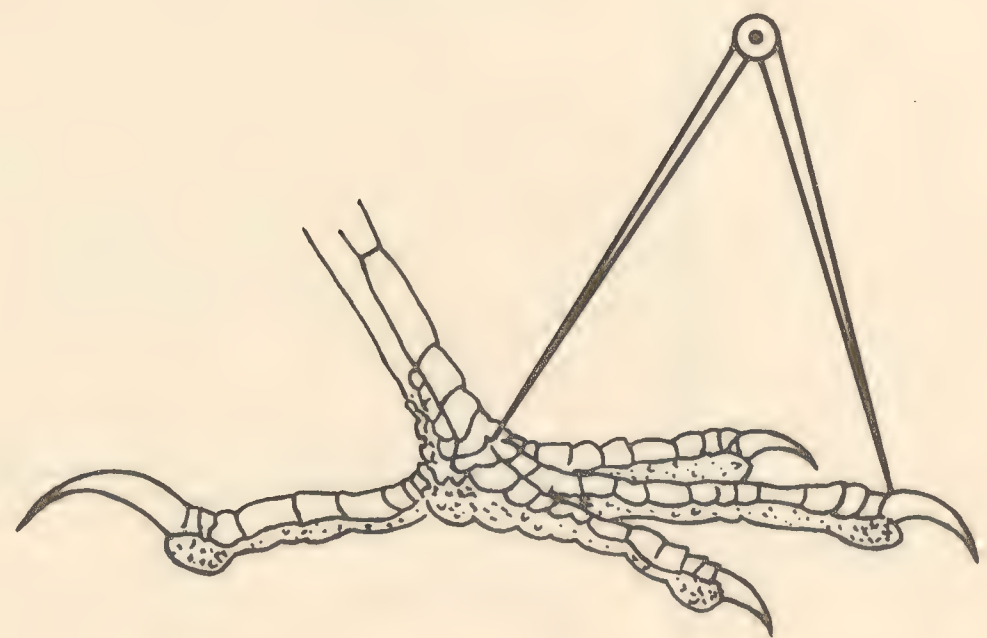
length of bill (exposed culmen)



height of bill at base



length of tarsus



length of middle toe (without claw)

upon which a single hand moves clockwise. First, the northernmost specimen locality (normally a county or counties) is ticked off, then the easternmost, southernmost, and westernmost. Variants of this clockwise progression are fairly numerous. Water birds are often traced from the northeast to southwest along the Gulf coast. Birds of subtropical origin are usually treated from the region of their abundance to the fringes of their range; that is, from south to north. Also, if a species or race has been collected in only a few counties these counties are simply named, usually in a more or less north to south order.

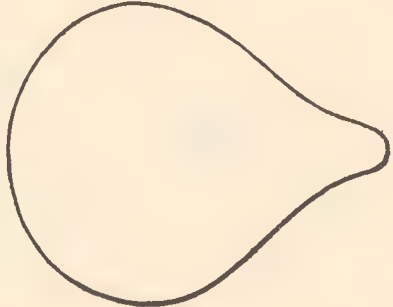
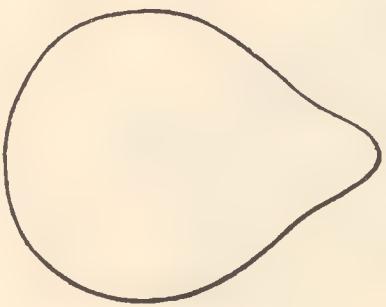
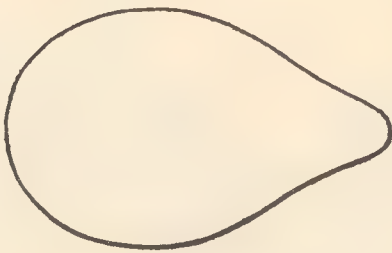
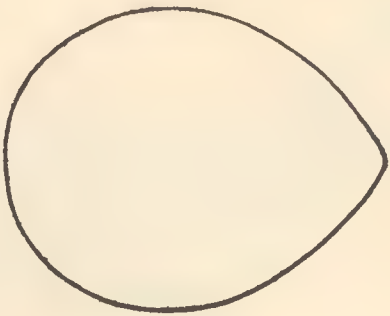
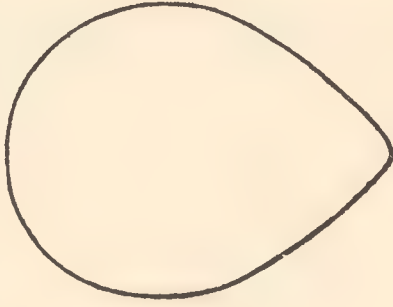
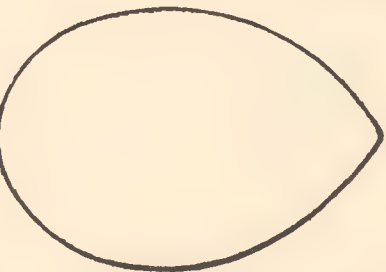
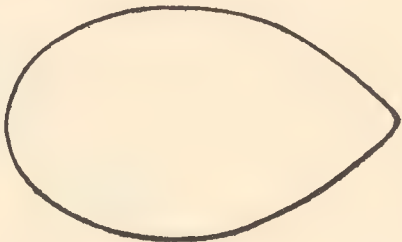
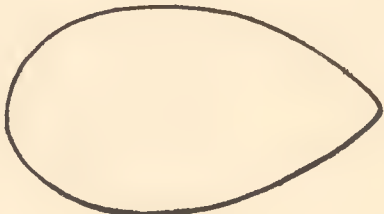
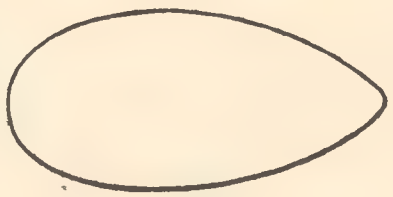
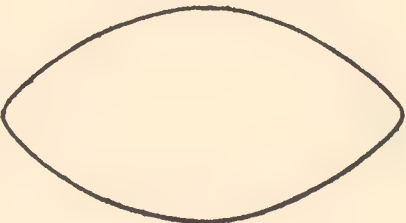
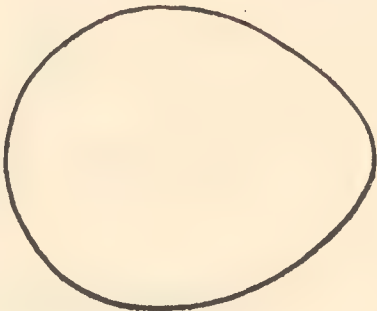
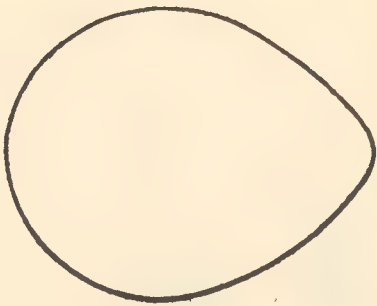
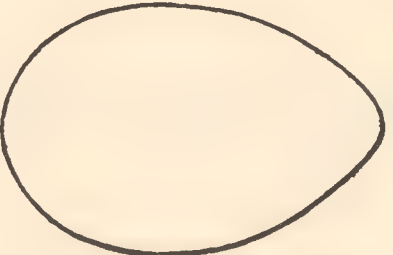
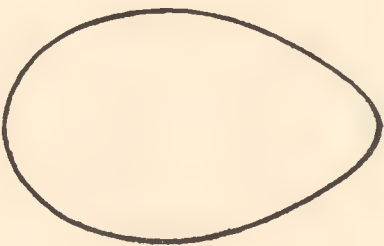
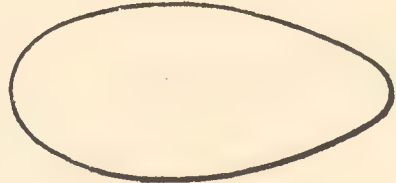
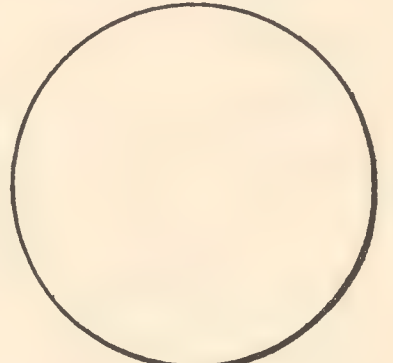
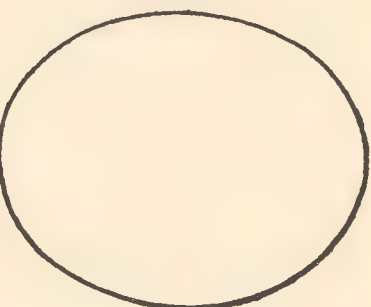
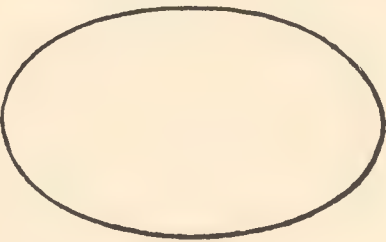
Migration range must be substantially different from breeding or winter range to warrant coverage. It is often difficult to determine from the records just what a bird was doing when it was taken—summering, migrating, or wintering. At times, a specimen record is placed under the subhead that seems most appropriate (or convenient) under the circumstance, even though the date of collection may fall outside the normal span of months designated for that season (see season table, p. xxiv). When such a specimen record is used, the month and day of collection are stated in parentheses

after the county in which the collection was made. For example, a Western Brown Thrasher was taken in Nueces County on October 1. Since this thrasher's Texas migration and winter ranges are virtually the same, there is no *Migration* subhead. Instead, the record—Nueces (Oct. 1)—is placed under *Winter*, even though this individual could have been either a fall migrant or a wintering bird.

Most arbitrary of all are the subspecies' breeding ranges. For each species, racial breeding ranges are based on subspecifically identified adult skins collected during the breeding season of that species, mostly within fifty miles of actual nest sites. Since nests or eggs ordinarily cannot be identified at the racial level, the probability is high that some of the specimens used to delineate subspecific breeding ranges were actually migrants of subspecies other than those of the nesters. (In this book, the condition of enlarged gonads is considered inconclusive proof of local nesting, except with females carrying fully developed eggs.)

When a species has two or more races occurring in Texas, an appraisal of abundance is given for each race. For species with one or no races, no appraisal is

EGG SHAPES

 pyriform	 subpyriform	 ovate pyriform	 rounded ovoid
 short ovoid	 ovoid	 elliptical ovoid	 elongate ovoid
 cylindrical ovoid	 fusiform	 rounded ovate	 short ovate
 ovate	 elliptical ovate	 elongate ovate	 cylindrical ovate
 spherical	 oval	 elliptical oval	 elliptical

given since the assessment in the species account applies.

NESTING: Birds which have nested, or attempted to nest, at least once, plus a few species which could quite possibly nest in Texas, are given a description of nest and eggs. First comes a statement of nesting habitat followed by nest site, form of nest, and composition of main portion and lining.

The following information is given about eggs: low and high number of eggs that have been found in a nest, usual clutch size; variation in shape (see above for diagram of egg shapes); texture of surface (e.g.,

glossy or dull); ground color; intensity and color of spots and blotches, if any, and part of the egg where markings are thickest; lastly, average size of eggs in millimeters (originally in inches).

The nest and egg section has been treated at the subspecies level because nests and eggs—especially ground color and spotting—sometimes differ within a species; also, average egg size frequently varies between races.

EDGAR B. KINCAID, JR.

Austin, Texas
November 13, 1973

THE BIRD LIFE OF TEXAS

History of Texas Ornithology

EARLY EXPLORATIONS (1535–1900)

Alvar Núñez Cabeza de Vaca's mention of "quails" appears to be the first record of birds seen within the territory that now comprises the state of Texas. During the late summer of 1535, natives brought quails, probably including Scaled Quail and Bobwhite, to the Spanish conquistador when he was near the mouth of the Pecos River in present-day Val Verde County. Cabeza de Vaca's account of this observation is recorded in *La Relación y Commentarios*, published in 1555.

Apparently the earliest definite record of any species of bird from Texas was a flock of Wild Turkeys seen on August 5, 1820, at longitude 102°45' west on the Canadian River in present-day Oldham County. These Turkeys, plus a few other species of birds, were observed by the naturalist of Major Stephen H. Long's expedition to the Rocky Mountains as it crossed the Texas Panhandle. The sighting is recorded in the second volume of the report, *Account of an Expedition from Pittsburgh to the Rocky Mountains*, by Edwin James, published in 1823.

It was John James Audubon, however, who made the first important contribution to knowledge of the birds of Texas. Notes recorded by Audubon on his trip to the coastal region of southeastern Texas in 1837 are embodied in the fourth and fifth volumes of his *Ornithological Biography*, 1838–1839, and the octavo edition of his *Birds of America*, 1840–1844.

With establishment of the Republic of Texas in 1836 and subsequent stabilization of the political situation, exploration of the southwestern frontier went forward apace; collection and observation of birds were often a part of the activity. Birds claimed to have been collected in Texas in 1838 were published in *Description of Sixteen New Species of North American Birds* (1841) by Jacob P. Giraud, Jr.; however, it is now fairly well established that most, if not all, of Giraud's specimens had been obtained in Mexico. The journal of another early explorer, Lieutenant James W. Abert, published in 1846, contains numerous references to birds encountered as he crossed northwestern Texas on his way from New Mexico in 1845. Bird notes made by Colonel

George A. McCall on his journey from San Antonio to New Mexico, 1849–1850, were published in the *Proceedings of the Academy of Natural Sciences of Philadelphia* for 1851. In 1852 George N. Lawrence published the original description of the Texas Olive Sparrow, *Arremonops rufivirgatus rufivirgatus*, together with records of a number of neotropical species until then unknown from Texas or, indeed, from what is now the United States. During the next year he published, in the *Annals of the Lyceum of Natural History of New York*, more extended notes on the habits and distribution of a number of Texas birds. Both of the above papers were based on the specimens and field notes of Captain James P. McCown, which were principally from the lower Rio Grande Valley.

Several parties sent to explore for railroad routes to the Pacific Ocean crossed parts of Texas. Most important of these was an expedition commanded by Captain John Pope, which started from the Hueco Mountains in western Trans-Pecos on February 17, 1854; the party traveled by way of Guadalupe Pass, Independence Spring, Big Spring, Fort Belknap, and Gainesville to Preston (Grayson Co.), arriving about May 15, 1854. Ornithological findings of Pope's expedition were embodied by Spencer F. Baird, John Cassin, and George N. Lawrence in the ninth volume of the reports on these railroad route explorations, issued in 1858. Numerous Texas bird observations are included in the *Report of an Expedition Down the Zuñi and Colorado Rivers, by Captain L. Sitgreaves*, published in 1854. However, the bird section, by Dr. S. W. Woodhouse, was evidently written from memory, and is, for the most part, rather unreliable.

The first extensive article dealing exclusively with the birds of Texas was published by Henry Eeles Dresser in the *Ibis* for 1865 and 1866. This consists of a well-annotated list of some 272 species which the author observed and collected, chiefly about San Antonio and in the Rio Grande Valley. Dr. H. B. Butcher made an extensive collection of birds at Laredo during 1866 and 1867 and published a sparingly annotated list of some 88 species in *Proceedings of the Academy of Natural Sciences of Philadelphia* in 1868. Another signifi-

cant contribution to the ornithological knowledge of the state is Lieutenant C. A. H. McCauley's "Notes on the ornithology of the region about the source of the Red River of Texas," published in 1877; it is an annotated list of 103 species observed chiefly in the Panhandle region.

One of the most important papers on the birds of Texas is Dr. James C. Merrill's "Notes on the ornithology of southern Texas." This is a fully annotated list of 252 species observed and collected by the author in the vicinity of Fort Brown at Brownsville from February, 1876, to June, 1878. Although other writers anticipated Dr. Merrill in reporting some of the most important discoveries, his contribution contains much valuable original matter. It was published in 1878 in *Proceedings of the United States National Museum*. During the same year, George B. Sennett published his "Notes on the ornithology of the lower Rio Grande of Texas," which is a fully annotated list of 151 species observed on the coast and lower Rio Grande during 1877. In the following year, Sennett's "Further notes on the ornithology of the lower Rio Grande of Texas" appeared with a list of 168 species observed and collected during the spring of 1878, principally at Lomita Ranch in southern Hidalgo County, and in the vicinity of Corpus Christi.

J. Douglas Ogilby's "Catalogue of birds obtained in Navarro County, Texas," published in 1882, is one of the most important faunal papers on Texas birds. It is a list of some 200 species, with copious notes on observation of habits and on specimens collected in 1879 and 1880 near Rice in northern Navarro County, and between this town and the Trinity River. In 1882, Nathan Clifford Brown published a list of 104 species which he observed at Boerne, Kendall County, between December 21, 1879, and April 4, 1880. This article contains a number of important notes on specimens and interrelationships of Texas birds. Henry Nehrling's "List of birds observed at Houston, Harris County, Texas, and vicinity, and in the counties Montgomery, Galveston, and Fort Bend," published in 1882, consists of notes on 209 species and subspecies. In 1887, Joseph L. Hancock published "Notes and observations on the ornithology of Corpus Christi and vicinity, Texas" in the *Bulletin of the Ridgway Ornithological Club of Chicago*, giving an annotated list of 91 species, with incidental mention of a few others.

Birds of west central Texas remained practically unknown until the publication in 1887 of William Lloyd's "Birds of Tom Green and Concho Counties, Texas." This list of 253 species contains results of Mr. Lloyd's many years of observations, chiefly in the vicinity of San Angelo and Paint Rock, and adds much to the knowledge of Texas birds. Many of his specimens were identified by Robert Ridgway.

From December, 1886, to March, 1887, Charles W.

Beckham observed and collected birds in south central Texas, chiefly at Corpus Christi, Beeville, and in Bexar County. Results of his studies were published in 1888 in "Observations on the birds of southwestern Texas," an annotated list of 283 species, which incorporates observations of previous observers in the region. This is one of the largest, most carefully written, and most valuable of early contributions to Texas ornithology.

Wells W. Cooke's "Report on bird migration in the Mississippi Valley," 1888, is of interest because of the large number of original records of Texas birds. Dr. Edwin M. Hasbrouck's "Summer birds of Eastland County, Texas," a list of 59 species with brief notes on habits, is worthy of note as a contribution to a hitherto ornithologically unknown part of the state, although it includes some birds that are certainly not summer residents.

Frank M. Chapman spent parts of March and April, 1891, in the vicinity of Corpus Christi and later in the same year published results of his observations in a paper containing partial lists of species observed, with notes on those of special interest. Samuel N. Rhoads visited Corpus Christi from May 17 to June 7 of the same year and in 1892 published results of his findings in a list of 108 species, with fairly extended notes. Harry P. Attwater's "List of birds observed in the vicinity of San Antonio, Bexar County, Texas," is an exhaustive account of the birds of that area. It is based on careful observations by the author covering a number of years from about 1884 to 1891; since a large number of his specimens were identified by Robert Ridgway, the list is unusually accurate. Notes on habits are added to many of the 242 species and subspecies treated. J. A. Singley, who collected in Texas for a number of years, published results of his observations in 1893 in the *Fourth Annual Report of the Geological Survey of Texas*, for 1892, under the title "Texas Birds." This paper consists of three annotated lists of species observed (1) in Lee County; (2) on Galveston Island; and (3) along the lower Rio Grande and in the vicinity of Corpus Christi.

LATER INVESTIGATIONS (1900-1940)

Of the many ornithological contributions made during the first forty years of the twentieth century, the following seem worthy of specific mention.

J. J. Carroll's "Notes on the birds of Refugio County, Texas," which appeared in 1900, is an annotated list of some 185 species found by the author in that area.

Vernon Bailey's report, *Biological Survey of Texas*, published in 1905 as number 25 of the North American Fauna series, is primarily an account of life zones, mammals, and reptiles of the state; however, it con-

tains so much valuable information concerning birds, particularly in their relation to life zones, that it is an important contribution to ornithological knowledge.

In 1910 John K. Strecker, Jr., published his "Notes on the fauna of a portion of the canyon region of northwestern Texas," which contains a list of birds observed during summer in the Panhandle region, chiefly in Armstrong County. Howard Lacey's paper, "The birds of Kerrville, Texas, and vicinity," published in 1911, contains results of the author's observations at his ranch on Turtle Creek, seven miles southwest of Kerrville, from 1882 to 1911. It is a list of 202 species with comments on habits, occurrence, distribution, and nesting. Furthermore, since many of the forms were determined from specimens, it is especially interesting for comparison with H. P. Attwater's list of the birds of San Antonio. *The Birds of Texas*, also by Strecker, appeared in 1912. It was the first attempt at a complete list of Texas birds. He accredited 546 species and subspecies to the state (several erroneously) and gave brief notes, chiefly on distribution.

"The breeding birds of Bexar County, Texas," by Roy W. Quillin and Ridley Holleman, which appeared in the *Condor* for 1918, provided nesting data that extended the known breeding ranges of several water birds.

Early notes on breeding water birds along the coast are of particular consequence in light of the environmental changes that have taken place in this region during the mid-twentieth century. Of much interest are the studies of T. Gilbert Pearson. From May 20 to June 7, 1920, he explored bird colonies along the Texas coast from Carancahua Bay, northeastern Calhoun County, to Brownsville, Cameron County, in an effort to locate possible sanctuary sites; his findings were published in the *Auk* for 1921. Also of note is John Roy Pemberton's "A large tern colony in Texas," published in the *Condor* for 1922, which relates his detailed observations on terns breeding in southeastern Cameron County in 1921, and includes remarks on several other species of water birds. Conditions existing in 1923 are reflected in a paper by Max W. DeLaubenfels in the *Wilson Bulletin* for 1924; this work concerns breeding species—particularly water birds—of Brownsville and vicinity.

Herbert Friedmann's account of birds he observed in May, 1924, in the lower Rio Grande Valley was published in the *Auk* for 1925. During the same year, and partly in 1926, there also appeared a comprehensive report of the birds of this region by Ludlow Griscom and Maunsell S. Crosby entitled "Birds of the Brownsville region and southern Texas." It gives an account of all birds then known from this region—some 333 species and subspecies—with comments on migration and breeding. This important contribution includes much

unpublished material from the field notes of the authors' trip, with notes and records from the collections of George B. Sennett and Austin Paul Smith.

Birds of the Austin Region by George Finlay Simmons, published in 1925, is one of the most thoroughly prepared contributions to the literature on Texas birds. It combines the author's own field investigations with observations of all those in the general region of Austin and contains much original information concerning the 294 species and subspecies included.

John K. Strecker, Jr.'s many years of observation in McLennan County furnished material for *Notes on the Ornithology of McLennan County, Texas*, listing 254 species and subspecies; it appeared in 1927. Two years later, in 1929, Strecker and Robert L. More coauthored an annotated list of the summer birds of Wilbarger County, published as a Contribution from the Baylor University Museum.

Results of findings of a group of bird observers in the Dallas area were published in two preliminary lists of the birds of Dallas County by Jerry E. Stillwell. These two lists, together with a long series of "Addenda" issued subsequently to the first list, and followed in 1939 by a completely annotated list, remain a mine of information on breeding, wintering, and migrant birds in that vicinity.

Another valuable series, *The Gulf Coast Migrant*, was compiled by George G. Williams from 1936 to 1947. While this work deals chiefly with migration records, it also contains many significant reports on breeding and wintering birds in coastal localities.

One of the most interesting contributions to Texas ornithological literature of this period is *The Birds of Brewster County, Texas*, by Josselyn Van Tyne and George Miksch Sutton. Based on field work by the authors and by other persons over a period of several years, it presents data on all species and subspecies then known to occur in the county. It appeared in 1937 as a Contribution from the University of Michigan Museum of Zoology.

Complete citations of the above works are listed by author in the Bibliography. The necessary brevity of the foregoing résumé, of course, precludes mention of a host of less important papers. These are also listed in the Bibliography, along with citations of the many important works published since 1940.

FIELD NATURALISTS (1890–1940)

During a period of approximately fifty years, field parties of the U.S. Bureau of Biological Survey (now Bureau of Sport Fisheries and Wildlife) visited virtually every part of Texas, some of the more important areas several times. The extent of these explorations

may best be appreciated from the following list of men who have done such ornithological field work in the state, including the years in which they were most active as investigators or collectors. Also listed are those connected with the Texas Cooperative Wildlife Research Unit, Texas A&M University, College Station.

Shaler E. Aldous, 1928–1936; Robert P. Allen, Apr.–May, 1934; Vernon Bailey, 1890–1906; Rollin H. Baker, 1938–1939; Thomas D. Burleigh, 1936–1939; Merritt Cary, June–Oct., 1902; Clarence Cottam, July, 1936; William B. Davis, 1937–1939; Gordon Donald, Aug., 1902; Basil H. Dutcher, Aug.–Sept., 1892; Albert K. Fisher, May, 1894, and Feb., 1911; James H. Gaut, 1903–1905; Donald A. Gilchrist, 1915–1916; Phil D. Q. Goodrum, 1938–1940; Ned Hollister, 1902; Neil Hotchkiss, Jan.–Sept., 1936; Arthur H. Howell, 1903–1907; P. V. Jones, June, 1939; Edwin R. Kalmbach, Oct.–Nov., 1931, and May–June, 1933; Daniel W. Lay, Feb.–May, 1937; Valgene W. Lehmann, 1934–1940; James S. Ligon, 1900–1908; William Lloyd, 1890–1894; John A. Loring, Jan.–May, 1894; Bernard E. Ludeman, 1937–1940; Alexander C. Martin, 1930–1934; Waldo L. McAtee, Dec., 1910; Harry C. Oberholser, 1900–1939; Tarleton F. Smith, 1938–1940; Charles C. Sperry, 1926–1937; Alexander Sprunt, Jr., 1934–1936; Walter P. Taylor, 1935–1940; and Alexander Wetmore, 1917–1918.

OTHER COLLECTORS (1828–1940)

In addition to the roving field naturalists of the U.S. Biological Survey, a number of other collectors, most of them residents of the counties where they took specimens, were active in the earlier days of Texas ornithology. In the following list they are given with localities at which they collected birds, nests, or eggs. (Communities of less than 5,000, based on 1960 census figures, are identified by county.)

Frank Blake Armstrong, Orange Co., Laredo, Cameron Co., Corpus Christi, and Kerr Co.; Frank Blake Armstrong, Jr., Nueces Co.; George Armstrong, Calhoun Co., El Paso, and Fort Worth; John Woodhouse Audubon, Galveston Bay region, and lower Rio Grande; O. G. Babcock, Juno in Val Verde Co.; G. W. Baines, Alpine in Brewster Co.; Nannie Barber, Refugio Co.; T. H. Barber, Aransas Co.; M. H. Barnum, Marathon in Brewster Co., and Fort Clark in Kinney Co.; Dr. T. Barrett, Clay Co.; C. P. Benedict, Stonewall Co.; Jean Louis Berlandier, lower Rio Grande region and other areas in south Texas; Emmet Reid Blake, Chisos Mts.; J. Bolle, Dallas; J. B. Bourbois, Lomita Ranch in Hidalgo Co.; R. Bowers, Gaines Co.; J. C. Braly, Sanderson in Terrell Co., and coastal regions; J. W. Brown, Giddings in Lee Co.; D. J. Bullock, Hidalgo Co., Flour

Bluff in Nueces Co., other points in south central Texas, and Galveston Co.; J. C. Burkett, Midland Co.; J. B. Burrage, Houston; D. B. Burrows, Nueces Co.; D. Canaday, Gainesville; G. G. Cantwell, Beeville; C. F. Carr, coastal region, and Nueces Co.; Dewitt Carrington, Guadalupe Mts.; V. Cavalos, Cameron Co.; H. Cherry, Lee Co.; Austin H. Clark, Brownsville; J. H. Clark, El Paso; J. A. Clarke, Comal Co.; C. L. Cloetta, Brownsville; Dr. D. Coleman, Langtry in Val Verde Co.; J. Cooks, Taylor Co.; S. Coppock, Coke Co.; E. J. Court, south coastal region, and Corpus Christi; L. Cowen, Brownsville; M. L. Cox, Guadalupe Mts.; Dr. J. C. Crawford, Victoria; Benjamin Mills Crenshaw, Austin; W. S. Cruzan, Bowie Co.; B. A. Curry, Bird Island in Laguna Madre; Verlaine Daniels, Tarrant Co.; D. C. Davis, Gainesville; N. L. Davis, Harris Co.; O. Davis, Nueces Co.; A. C. Doerge, Navasota in Grimes Co.; A. D. Doerge, Navasota; C. A. Doerge, Navasota; J. P. Drown, Corpus Christi; Patrick Duffy, Fort Stockton; J. B. Dunn, Corpus Christi; B. H. Dutcher, Stanton in Martin Co.; R. E. Earll, Hempstead in Waller Co.; O. P. Easterwood, Austin; F. B. Eastman, San Antonio; Del Ellsworth, coastal region; L. Esmond, Taylor Co.; R. Fancher, coastal region; C. E. Farley, coastal localities (including Refugio and Victoria cos., Tarpon in Nueces Co., and Laguna Madre); Thomas James Farr, Austin; William C. Flint, Nueces Co.; S. Flores, Rio Grande City; A. J. Foard, Fort Davis in Jeff Davis Co.; G. A. Foote, Clay Co.; Nathaniel A. Francis, Lomita Ranch in Hidalgo Co., and Houston; M. Abbott Frazar, Lomita Ranch, Rio Grande City, and other localities in lower Rio Grande Valley; C. R. Friebele, Comal Co.; E. Friebele, Comal Co.; G. L. Friebele, Comal Co.; J. A. Friebele, Comal Co.; R. Friesch, Guadalupe Mts.; Frederick M. Gaige, Brewster Co.; G. H. Gaumer, El Paso; John S. Gething, Kerrville; Geoffrey Giles, Kendall Co.; Thomas San Francisco Gillin, Corpus Christi, Laguna Madre, Nueces River, Cranes Mill in Comal Co., San Marcos, Oakville in Live Oak Co., Beeville, Gonzales, and San Antonio; B. Godbold, Uvalde; Benjamin Franklin Goss, mouth of Colorado River, and Corpus Christi; C. B. Gray, Refugio Co.; Edward K. Green, Austin and Corpus Christi; E. C. Greenwood, Cameron Co.; M. G. Greig, Guadalupe Mts.; D. Griffin, Jr., Sour Lake in Hardin Co.; E. Griffin, Sour Lake; A. Hall, Clay Co.; John F. Hammond, Austin and Rio Grande City; Nat W. Hardy, Waco; C. Harris, Bee Co.; G. H. Harris, Calvert and Franklin, both in Robertson Co.; H. H. Harris, La Salle Co.; S. Hayes, El Paso, and Fort Belknap in Young Co.; L. Heiligbrook, Austin; W. F. Henninger, Cameron Co.; R. D. Hildebrand, Starr Co.; R. T. Hill, Mount Livermore in Davis Mts.; F. X. Holzner, El Paso region; A. B. Hood, Burleson Co.; H. Howard, Lytle in Atascosa Co.; J. E. Hubby, Beau-

mont; G. E. Hughes, Somerset in Bexar Co.; Chester Irvine, Georgetown; Edward C. Jacot, Chisos Mts.; Charles Jefferys, Laredo; H. Johnson, Gainesville; A. L. Judkins, Taylor; J. J. Justin, Rio Grande City; E. Kasch, Caldwell Co.; W. B. Keesee, Ozona in Crockett Co., and San Angelo; F. Kellogg, Wheelock in Robertson Co.; W. S. Kellogg, Wheelock; W. Kelly, coastal region; B. Kennerly, Matagorda Co.; J. M. King, Midland Co.; Hal Parks Kirby, Dallas Co.; W. B. Kirby, Young Co.; Louis Harry Kirk, Austin; A. B. Klugh, Calvert and Franklin in Robertson Co., and Victoria; Tom Knock, coastal region; W. J. Knowlton, Kendall Co.; W. Koelz, Mount Pleasant, Encino in Brooks Co., Brownsville, Georgetown, Beeville, Austin, Maud in Bowie Co., Poth in Wilson Co., Roosevelt in Kimble Co., Robstown, Papalote in Bee Co., and Omaha in Morris Co.; Harry Joseph Kofahl, Austin; S. A. Krom, Troup in Smith Co.; F. Kroofer, Brownsville; A. L. Kumlien, Hempstead in Waller Co.; R. Lancaster, Lee Co.; C. L. Lehman, Guadalupe Mts.; C. L. Leith, Padre Island and vicinity; Gideon Lincecum, Washington Co.; Albert C. Lloyd, Brewster Co.; F. A. Lockhart, Beeville and Corpus Christi; J. S. Lockwood, Fort Stockton; C. Loomis, Concho Co.; J. A. Loomis, Paint Rock in Concho Co.; John J. Lynch, Mission; F. Mack, Comal Co.; Guy MacLaughlin, Austin; J. W. Mann, Denton Co.; R. S. Matthews, Brownsville; W. A. Mayer, Dallas; C. A. McAtee, Lake Surprise in Chambers Co., Rockport, and Matagorda Co.; Capt. John P. McCown, Rio Grande Valley; M. M. McFarland, coastal region; C. R. McLendon, Brewster and Tarrant cos.; Thomas O. McMillan, Corpus Christi, and Mercer in Nueces Co.; W. E. McNabb, Matagorda Co.; J. Means, Gainesville; E. A. Mearns, Fort Clark in Kinney Co., Fort Hancock in Hudspeth Co., and El Paso; Louis di Zarega Mearns, Fort Clark; L. H. Meitzen, Galveston and neighboring cos.; Travis C. Meitzen, Galveston and neighboring cos.; Arthur Merritt, Jr., Nueces Co.; Jesse Miller, Fort Bend Co., and Colmesneil in Tyler Co.; Will A. Miller, Jr., Herman Station in Wise Co.; Walter Mills, Vingtune Islands in Chambers Co.; C. H. Moores, Texarkana; John Morden, Bexar Co.; C. W. More, Jr., Wichita Co.; W. A. More, Alvord in Wise Co.; W. A. Myers, Refugio Co.; A. Neville, Jones Co.; F. L. Noyes, McLennan Co.; S. W. Parish, Calvert in Robertson Co.; Lt. J. G. Parke, El Paso; J. Grafton Parker, Jr., Port Lavaca; P. B. Peabody, Pecos River; V. Phem, Colorado City; Clothier Pierce, Dallas, Jefferson in Marion Co., and Refugio Co.; J. T. Potter, Fort Clark in Kinney Co.; E. T. Prade, Brewster Co.; Earl Prade, McLennan Co.; W. H. Prade, Davis Mts.; C. R. Prauty, Indianola in Calhoun Co.; J. W. Preston, Refugio Co.; D. Priour, Corpus Christi; Isadore Priour, Kerrville; G. H. Ragsdale, Gainesville; E. Raube, Giddings in Lee Co.; J. B. Reinhardt, Childress Co.; J. R. Reinhardt, Bastrop Co.;

V. Reinhardt, Colorado Co. and Terrell; E. Ricksecker, Comal Co.; Wirt Robinson, El Paso; Th. Rupchaud, Roosevelt in Kimble Co.; C. H. Saunders, Houston; George B. Saunders, Brewster Co.; H. Sayles, Jr., Taylor Co.; A. Schott, Brownsville; P. Schwartz, Lee Co.; John B. Semple, Brewster Co.; H. M. Shouk, Smith Co.; G. F. Simmons, Seabrook in Harris Co.; E. A. Small, Eagle Pass; H. Smissen, Scurry Co.; Clarence A. Smith, Corpus Christi; P. U. Smith, Bexar Co.; Philo W. Smith, San Antonio; T. Smith, Brownsville; W. Smith, Bolton in Walker Co.; Andrew Sorenson, Corpus Christi and Rockport; A. R. Starr, Lake Caddo; I. L. Stoker, Upshur Co.; Charles Stroup, Montague Co.; McClure Surber, Devils River and west Texas; S. Sweeney, coastal region; Dr. E. Swift, Coke Co.; D. H. Talbot, coastal region; L. S. Thompson, Kingsville; P. M. Thorne, Kinney Co.; F. W. Thorow, Harvester in Waller Co.; Sam Timey, coastal region; Frank J. Tobin, Chisos Mts.; G. W. Todd, Kinney Co.; G. Toudouze, Bexar Co.; Melvin A. Traylor, Jr., Chisos Mts.; H. Ulen, Motley Co.; S. Van Vliet, Brownsville; E. A. Vigneau, Val Verde Co.; E. A. Walker, Guadalupe Mts.; J. H. Walton, Albany in Shackelford Co.; H. Warren, Jr., Starr Co.; W. R. Warren, coastal region; J. Watson, Bexar Co.; G. Weaver, Cooke Co.; Charles Webb, Herman Ranch in Victoria Co.; Walter A. Weber, Brewster Co.; I. H. Wentworth, San Antonio; William H. Werner, Brazoria Co., Corpus Christi, Laguna Madre, Nueces River, Cranes Mill in Comal Co., and San Marcos; J. A. Whaley, Gainesville; J. H. Whitefield, Duval Co.; G. S. Wing, Cameron Co.; W. B. Winton, Dallas; H. A. Wise, Jr., Taylor Co.; H. J. Wise, Callahan Co.; F. W. Wood, southern coast; N. A. Wood, Coleman Co.; William S. Wood, Fort Davis in Jeff Davis Co.; A. D. Woodman, Brownsville; Frank M. Woodruff, Brazos Co., Galveston region, and Bolivar Peninsula; W. J. Woolston, coastal region from Corpus Christi and Port Aransas to Brownsville and Port Isabel; W. W. Worthington, Hidalgo, Victoria, and Nueces cos.; Charles Wright, El Paso region, and elsewhere along the Rio Grande; J. Yancey, Bell Co.; Woodruff Yates, Tarrant Co.; R. T. Young, Kendall Co.; Jake Zeitlin, Fort Worth.

COLLECTIONS OF FRANK BLAKE ARMSTRONG

Two previously unpublished records of birds taken for the first time in Texas—both constituting new records for the United States—are accepted in this book on the basis of specimens collected by Frank Blake Armstrong of Brownsville. The species are Black Catbird, *Melanoptila glabrirostris*, and Brasher's Golden-crowned Warbler, *Basileuterus culicivorus brasierii*. Two additional species new to the United States are

also included on the basis of recent reidentifications of Armstrong specimens previously mislabeled. These are the Gray-tailed Roadside Hawk, *Buteo magnirostris griseocauda* (see *Auk* 81 [1964]: 435), and Fuertes' Oriole, *Icterus fuertesi* (ibid., p. 433). In view of the unusual nature of these records, it seems worthwhile to relate previously unpublished details regarding the field activities of Frank B. Armstrong.

The Black Catbird and Brasher's Golden-crowned Warbler, both collected by Armstrong near Brownsville in the lower Rio Grande region, are in the bird collection of the Academy of Natural Sciences of Philadelphia. Dr. Witmer Stone, curator of birds at the Academy, informed the author that he knew of the existence of these specimens, and that at least one of them, *Melanoptila glabrirostris*, had been identified by Robert Ridgway; however, for various reasons neither of the records had ever been published. They form part of a considerable collection of birds bought by Josiah Hoopes, of Philadelphia, from Armstrong before 1897 and presented to the Philadelphia Academy. The collection was made by Armstrong without the aid of other collectors, and, when sold to Mr. Hoopes, the birds were purchased at a uniform price per specimen, so there was little or no reason for including rare, rather than common, birds in the lot. Furthermore, Armstrong apparently was unaware of the rarity of these birds, which at the time of their sale had not been identified.

In order to obtain reliable information regarding the methods and activities of Frank B. Armstrong, the author discussed (probably ca. 1920—EDITOR) his collecting with his widow, Mrs. Frank B. Armstrong, who at that time was still living in Brownsville. Further details were later obtained from his son, Frank B. Armstrong, Jr. The information is of interest to all ornithol-

ogists who have occasion to handle any of the many thousands of bird skins gathered by Armstrong. Armstrong began collecting birds at Brownsville in about 1888 and continued until his death there in 1915. Much of his collecting was done in the vicinity of Brownsville—and this almost entirely on the Texas side of the Rio Grande; however, as he ranged for a great many miles up and down the river, the term Brownsville on his labels should be broadly interpreted. From Mrs. Armstrong, the author learned that until at least 1895 Mr. Armstrong did absolutely no collecting on the Mexican side of the Rio Grande; therefore, all the birds he collected until that time were from Texas. Nor did he obtain birds from Mexicans or others. Furthermore, during his subsequent trips to Mexico to collect for museums and individuals, he labeled his specimens in his own handwriting as from localities in Mexico where obtained.

Armstrong was also very particular in labeling his specimens, and barring, of course, accidental mistakes that occur with everyone, his labels can be relied on for date and locality. As his son informed, he was very loath to allow others, even his own son, to do bird collecting for him. However, for the collecting of birds' eggs from colonies, he frequently hired assistants, and if there is any mixing of such specimens it is for this reason. Few collectors in the United States were more active than Frank B. Armstrong and few contributed more specimens to museums. In fact, his specimens are in almost every large collection in the United States, and in other countries as well. It is, therefore, of importance to have the facts fully understood—not only in their bearing on the valuable Texas records mentioned above, but also with regard to all other specimens he contributed to science.

Ecology of Texas Birds

The student of avifauna, whether professional or amateur, quickly realizes the necessity for a working knowledge of ecology—including climate, physiography, plants, and other natural factors that influence the lives of wild creatures. Nor can the effects of man's ventures in agriculture, forestry, city-building, etc., on the environment be ignored.

It is the sum of nature's influences that fashions broadly generalized divisions which man has called life zones. Within each life zone, more specialized ecological associations can be described in which specialized bird species live in response to the various combinations of natural features. The life zones of Texas have been so fully discussed by Vernon Bailey in the *Biological Survey of Texas* (1905, North American Fauna, no. 25) that the reader is referred to that publication. Since the 1940's, another classification of natural regions—biotic provinces—has gained wide acceptance. For application of this concept to the Lone Star State, see W. Frank Blair's "The Biotic provinces of Texas" (1950, *Texas Journal of Science* 2: 93–117).

CLIMATE

The climate of Texas varies greatly. However, the state may be divided climatically into three sections: (1) humid eastern; (2) semiarid northwestern, central, and southern; and (3) arid Trans-Pecos.

The average annual temperature ranges from about 56° Fahrenheit in the northwestern part of the Panhandle to about 70° along the coast, and to 74° in the Rio Grande delta. The lowest temperature for the state is 23° below zero, recorded both at Tulia (Swisher Co.) on February 12, 1899, and at Seminole (Gaines Co.) on February 8, 1933; but 8° is the minimum on record along the eastern part of the coast, and 12° the lowest for the Rio Grande delta. The maximum high temperature officially recorded for the state is 120° at Seymour (Baylor Co.) on August 12, 1936. Temperatures of 110° occur occasionally in the north central and southwestern part of the state. The average number of days in a

year which have a maximum temperature 90° or above ranges from 150 days in a narrow strip along the Rio Grande from Laredo to Del Rio to 90 days over the remainder of the state north to the Panhandle. In the Panhandle, and along most of the central and upper coast, this average varies from 90 days per year to slightly less than 60. The average number of days in a year on which the temperature is 32° or less ranges from 120 days in the northwest corner of the Panhandle to 2 on portions of the central and lower coast and in the Rio Grande delta. The earliest freeze usually occurs by November 1 in the Panhandle, but averages as late as mid-December on the central and lower coast. The last freeze in the spring ordinarily falls between the beginning of February (in the extreme south) and the end of March, but averages as late as mid-April in the northwest corner of the state.

The average annual rainfall is 50 inches or more in the extreme eastern part of the state and decreases regularly westward until it reaches 30 inches in the central portions, and a minimum of about 8 inches in the extreme western part (El Paso). There is, however, great variability in rainfall, and about one year in ten, the annual total may exceed 70 inches in the extreme east, 35 inches along the lower coast, and 15 inches in the extreme west. The greatest rainfall within twenty-four hours recorded for any locality in Texas is 38.2 inches at Thrall (Williamson Co.) in September, 1921. As a general, but fallible, rule, the eastern part is wettest in spring and driest in summer; for the central portion, spring is wettest and winter driest; for the western part, summer is wettest and spring driest. Snow is almost unknown in the Rio Grande delta and averages less than an inch per year along the coast, but increases to about 23 inches in areas of high altitude in the northwest. Fog is rare in the extreme western part of Texas, but occurs on about 42 days each year in the southeastern part. The number of days with thunderstorms varies from about 60 on the easternmost part of the coast to about 40 in extreme west Texas, and to 30 in the Rio Grande delta. Occasionally, thunderstorms are accompanied by damaging winds and hail.

Mean annual relative humidity at noon varies from just over 60 percent along the coast to about 35 percent in the El Paso region.

The average annual wind velocity varies from about 14 m.p.h. in the northern Panhandle to 9 m.p.h. in east Texas. The highest sustained wind velocity (fastest mile) recorded was 145 m.p.h. at Matagorda and Port Lavaca on September 11, 1961, during Hurricane Carla. The highest peak gust (instantaneous velocity) was an estimated 180 m.p.h. recorded at both Aransas Pass (San Patricio Co.) and Robstown (Nueces Co.) on August 3, 1970, during Hurricane Celia. A wind speed of 280 m.p.h. was recorded by Doppler radar within the vortex of a tornado at Wichita Falls on April 2, 1958.

PHYSIOGRAPHY

Texas, formerly the largest state in the United States, contains 267,339 square miles of land and inland water. Latitudinally it extends from 36°30' N. to 25°50' N.; longitudinally it lies between 93°31' W. and 106°38' W. Texas' great size and its geographical position—the state reaches north to the Great Plains, south almost to the Tropics, east to the humid forests, and west to the deserts—bring within these boundaries a diversity of physiographic conditions surpassed by no other U.S. state with the possible exception of California. In general, Texas may be described as a terraced plain, much broken and cut by erosion, rising in successive stages from the coast to the top of the Staked Plains, at an altitude of nearly 5,000 feet, and to the desert plateau of the Trans-Pecos, where mountain peaks reach a height of nearly 9,000 feet.

The state may be divided into three major natural regions, corresponding approximately to the geological structure of the terrain: (1) Gulf coastal plain, comprising, in its widest sense, the area lying south and east of the Balcones Escarpment; i.e., from the Rio Grande and Gulf of Mexico, north to Uvalde County, McLennan County, and the Red River; (2) plains region, extending north of the Balcones Escarpment to and including the Panhandle, and west to a little beyond the Pecos River; and (3) mountain region, in the southwestern part of the state, including most of the Trans-Pecos.

RIVERS: Texas is well supplied with rivers, many of them large, but most subject to extreme fluctuation in water flow due to uneven precipitation in the regions from which they draw their supply. The Canadian River, traversing the northern Panhandle, and the Red River, rising in the northwestern part of the state and forming part of the boundary with Oklahoma, are typical rivers of the semiarid Great Plains, with broad,

flat, often sandy beds and valleys that contain little water except at flood stage. However, the headwaters of the Red River have cut two spectacular canyons through the edge of the Llano Estacado. Part of Palo Duro Canyon on Prairie Dog Town Fork of the Red River has been embraced in a state park bearing the same name; the lesser known Tule Canyon, on Tule Creek, merges with Palo Duro Canyon on the south.

The Sabine and Neches rivers of the southeast are, particularly along their lower courses, more like the streams of Louisiana in their relatively narrow valleys, sluggish flow, and rich vegetation.

The Trinity, Brazos, Colorado, Guadalupe, San Antonio, Nueces, and Frio rivers, which drain the great interior portion of Texas, are fairly rapid in the upper portions of their courses, where most of them have cut canyons in the escarpment of the Edwards Plateau; however, they become broader and more sluggish toward the coast. For the greater part, their banks are wooded, and along some of them heavy timber exists. Two of these rivers, the Brazos (which has the largest average annual water flow) and the Colorado, have their headwaters in New Mexico but are not permanent rivers west of the eastern edge of the Staked Plains.

Two other major rivers—the Pecos and Rio Grande—drain the southern and central western portions of the state. These typical desert rivers run partly in wide, broad, level-floored valleys, partly through deep narrow canyons, and are fringed little, if at all, with timber. Throughout its lower course, the Pecos has cut a canyon some 300 feet deep in the surrounding mesa. Some four miles above its mouth it is spanned by the famous Pecos High Bridge of the Southern Pacific Railroad, one of the highest bridges in the world. The Rio Grande has cut several deeper canyons along its course from El Paso to the Gulf of Mexico, notably the Big Bend canyons of Santa Elena (ca. 1,500 ft. deep), Mariscal (ca. 1,600 ft.), and Boquillas (ca. 1,500 ft.).

SWAMPS: Wooded swamps of rather limited extent occur about Caddo Lake and along the Sabine, Neches, and other rivers of the eastern woodlands. Some of these, however, are dry except during rainy years.

GULF COAST: The coast of Texas is low and for the most part sandy. It is deeply indented by many shallow bays, the mouths of which are protected from the Gulf of Mexico by a chain of low narrow peninsulas and barrier islands. The resulting lagoons, as well as the bays and sometimes the coastline itself, are fringed in places with extensive tidal salt marshes. Inland of the salt marshes are freshwater marshes bordering ponds and lakes. The Gulf peninsulas and islands are merely strips of sand and seashell. On the seaward side they are often windswept into dunes of fantastic shape,

but slope off on the landward side to wide expanses of tidal mud flats.

LAKES: Considering its great area, Texas is poorly supplied with natural lakes, and these are, as a rule, shallow bodies of water. Caddo Lake, about 30 miles in length, in the northeastern part of the state, lies partly in Louisiana and is actually a swampy enlargement of Big Cypress Creek. Although Caddo was originally created by a natural log jam, its surface and capacity have been increased and maintained by a man-made dam. Sabine Lake, in the southeast corner of Texas, receives water from the Neches and Sabine rivers. It connects with the Gulf of Mexico by a narrow outlet called Sabine Pass. Long Lake in southwestern Anderson County is a portion of the old bed of the Trinity River, as are two other small lakes nearby. Espontosa Lake in north central Dimmit County and Mitchell Lake south of San Antonio are two small bodies of water well known as resorts for waterfowl. A few notable lakes near or along the coast include Austin Lake in Matagorda County, Green Lake in northwestern Calhoun County, and Lake Charlotte and Lake Surprise in Chambers County. In the Panhandle are a number of fresh and salt lakes, most of them without surrounding vegetation except grass. The most important of these are Monument and Muleshoe lakes, both in Bailey County. There are a few other small lakes scattered about the rest of the interior and a few desert ponds in the Trans-Pecos. Perhaps the Salt Basin west of the Guadalupe Mountains should be considered a lake but it contains water only after heavy rainstorms. Toyah Lake in Reeves County is merely a desert sink.

In addition to natural lakes many artificial lakes and reservoirs have been created in Texas, especially since the 1930's. By 1970, there were 157 major reservoirs existing or under construction in the state. (For a complete list, see *Texas Almanac—1972–1973*.) These man-made impoundments—together with municipal sewage evaporation ponds and countless livestock watering tanks—are of considerable value for migrating and wintering water birds.

EDWARDS PLATEAU: This area—its more rugged parts often called the Texas Hill Country—is in the south central portion of the state. It extends east to the western outskirts of the city of Austin, south to the Balcones Escarpment in Kinney, Uvalde, Medina, and northern Bexar counties, west to the mouth of the Pecos River, and north to the southern border of the Staked Plains into which it gradually merges in the neighborhood of Midland County. In altitude it ranges from about 1,000 to 2,500 feet. The highest part of this plateau is more or less level prairie or rolling grassy country interspersed with a somewhat scattered growth of bushes and low trees. Elsewhere, however, it has been much

affected by erosion and is a broken rocky area of hills, isolated buttes, bluffs, ridges, gulches, and deep valleys. This is particularly the case along the southern edge, where the headwaters of the Guadalupe and Nueces rivers have cut the edge of the plateau into an almost mountainous region which supports, especially along the streams, a good growth of timber. The rugged hills were once heavily clad with juniper (cedar), but this has now been largely cleared.

DESERTS: Lying west of the Pecos River, the deserts of Texas are for the most part northern extensions of the Chihuahuan Desert of Mexico. They consist of sun-baked plains, broad level river valleys, and stony mesas, covered at most with a stunted and scattered growth of desert shrubs. West of the Guadalupe Mountains is the extensive Salt Basin, which is generally devoid of vegetation.

MOUNTAINS: With the exception of the Castle Mountains in Crane and Upton counties, the mountains of Texas lie west of the Pecos River. The highest and most important are the Guadalupe, Davis, and Chisos mountains—all situated approximately midway between the Pecos River and the western limit of the Trans-Pecos.

The Guadalupe Mountains are about one hundred miles long by twenty to thirty miles wide. However, scarcely half of these mountains are in Texas. They are separated by a low gap from the Sacramento Mountains of southern New Mexico; both groups extend Rocky Mountain flora and fauna southward into the Lone Star State. The Guadalupes consist of stratified limestone, breaking off abruptly on the western side into the Salt Basin but descending on the eastern slope by gradual steps into the Pecos Valley. Southeastward, the Guadalupes extend in a series of decreasing hills toward the Davis Mountains, from which they are separated by a much lower and wider gap. The Guadalupe Mountains are broader and more plateaulike in New Mexico, narrowing in Texas to ridges 7,000 to 8,000 feet high and culminating in Guadalupe Peak, 8,751 feet, the highest point in the state. That portion lying in Texas is deeply cut by canyons, most notable being beautiful McKittrick Canyon. There is little or no permanent water above 6,000 feet and springs are scarce. The Guadalupes are covered generally with a rich growth of forest grasses and above 6,000 feet by a rather scattered growth of timber, which on the level, plateaulike top of the mountains forms in places beautiful parklike forests. The sides of the ridges are clothed locally with a dense growth of brush. In 1966, a part of the Guadalupes in Texas was authorized for preservation in the 77,000-acre Guadalupe Mountains National Park.

The Davis Mountains lie southeast of the Guadalupes in the central Trans-Pecos. This old volcanic group rises out of a high plateau which merges west-

ward into grassy and desert plains and eastward into the mesas of the Pecos Valley. Northward the foothills dwindle to the gap that separates the Davis from the Guadalupe, and southward the foothills are almost continuous with the Ord and Santiago mountains, which are more or less timbered groups connecting the Davis with the Sierra del Carmen in southern Big Bend. While generally consisting of gentler slopes than other Trans-Pecos mountains, the Davis Mountains are scored by canyons, the sides of which are in some places flanked by high cliffs or rows of basaltic columns. Ridges rise to 7,000 or 8,000 feet; the highest peak, Mount Livermore, or Baldy Peak, has an elevation of 8,382 feet. Notwithstanding the numerous canyons, water is scarce in the mountains, though at lower elevations the streams were, at least prior to 1930, partly or wholly permanent, as in beautiful Limpia Canyon. Except on the absolutely bare rocky slopes, the mountains were covered with a good growth of brush; this, however, has been much overbrowsed by livestock and deer since about 1950. The upper slopes support an open forest of junipers, pines, and oaks. Faunally, these mountains are, like the Guadalupe, a southern extension of the Rocky Mountains.

The Chisos Mountains lie in extreme southern Trans-Pecos in southernmost Big Bend. Rising as they do from a relatively low elevation of just over 2,000 feet along the Rio Grande, they overlook the desert of the Rio Grande Valley and, for a long distance, the country southward into Mexico. They are a group of old volcanoes worn down by erosion until their cliffs, peaks, and pinnacles of basalt and other volcanic rocks resemble castellated ruins. The old craters appear to have been obliterated, which indicates that these igneous rocks are not of recent origin. The Chisos Mountains, not over fifteen or twenty miles in length from north to south, are a ruggedly scenic area, full of deep gulches and canyons, high cliffs, and sheer precipices. Its steep rough slopes are deeply scored by canyons. Many of the peaks are sharply pointed; only Plateau Mountain has a relatively large area of more or less level land on the top. The higher ridges rise to elevations of 7,500 feet or more, while the highest point is 7,835 feet on Mount Emory. There is no permanent running water in the mountains, and springs are few. Most of the tops and slopes are covered with a good growth of grass; the lower portions, with fairly continuous brush. From about 5,500 feet to the summits, the slopes are covered with open timber, both deciduous and coniferous. Being the northeasternmost extension of the mountains of the Mexican tableland, this mountain group contains several plants and animals found nowhere else in the United States. Of these, the perpetually wilted drooping, or weeping, juniper (*Juniperus flaccida*) is the most picturesque plant, and the

Colima Warbler the most sought after by bird watchers from all over the nation. Fortunately, the Chisos Mountains have been preserved since 1944 within the 708,221-acre Big Bend National Park.

The Chinati Mountains are situated along the Rio Grande in the desert region northwest of the Chisos. They are a small, more or less timbered group characteristic of desert mountains; the highest summit, Chinati Peak, reaches 7,730 feet. In extreme western Trans-Pecos are the Sierra Blanca, Hueco Mountains, and Franklin Mountains, all of which are bare desert groups rising out of the arid plain.

PLAINS: Most of Texas consists of plains, but the most famous are those of the Panhandle and associated level land which constitute the southern terminus of the Great Plains. The Panhandle is divided into the North Central Plains and the High Plains. The latter plains extend north to Dallam County and west to the Pecos River Valley beyond the New Mexico boundary, east to the Cap Rock Escarpment (which runs from about Howard County north irregularly through Borden, Garza, Crosby, Dickens, Motley, Briscoe, Randall, and Armstrong counties), and south to the northern border of the Edwards Plateau into which they gradually merge. The High Plains are divided into two areas by the valley of the Canadian River. The portion south of the river is known as the Llano Estacado, or Staked Plains, and is bounded abruptly on the east by the Cap Rock. The part north of the Canadian River is called the Panhandle High Plains and passes eastward more gradually into the North Central Plains in the eastern Panhandle. These plains have an altitude of 2,500 to 4,700 feet and once consisted of extensive level or rolling grassy stretches with little or no shrubby growth. However, these grasslands have been largely converted to raising of cattle and growing of wheat, grain sorghums, and cotton. There are few streams in the area, though the edge of the plains is much eroded into canyons and gulches. The only timber exists in these canyons and gulches and at ranches where water is available.

The old and new coastal plains include all of Texas northeast, east, and south of the Edwards Plateau. Eastern woodlands interspersed with prairies occupy much of the old coastal plain in the east, and brush grows on the old plain to the south; the latter is sometimes called the Rio Grande Plain. Open tall grass prairie is in places 50 miles wide on the upper coast but narrows to from 1 to 10 miles along the central and lower coasts.

VEGETATION

In keeping with the diverse climate and physiog-

raphy, the vegetation of Texas exhibits great variety. This is particularly noticeable when the flora of the east is compared with that of the coast, Rio Grande delta, semiarid interior, the Staked Plains, or the arid Trans-Pecos.

EASTERN FORESTS: Pines of three species dominate the better-drained areas of eastern Texas. A forest of longleaf pine (*Pinus palustris*), which once occupied an area of about 5,000 square miles in the extreme southeast, is an extension of the same forest in Louisiana. This forest, however, is now heavily cut-over or replaced with twentieth-century plantings of introduced trees, especially the quick-growing slash pine (*P. elliotii*). Growing far apart, with little or no undergrowth, mature longleaf pines form parklike forests. The loblolly pine (*P. taeda*) predominates north and west of this area and in narrow tongues (notably in the Houston region) reaches down into the prairie country of the upper coast. This forest is much denser than that of the longleaf pine and is more mixed with broadleaf trees and shrubs; here and in nearby oak woods, two species of yaupon holly (*Ilex decidua* and *I. vomitoria*) form extensive thickets. In Hardin and surrounding counties, virtual jungles of pines mixed with hardwoods, along with the more open upland forests, create what is known as the Big Thicket, one of the last stands of wild timber in the United States. The northeastern part of the state is occupied chiefly by the shortleaf pine (*P. echinata*), the forests of which are much mixed in places with various species of hardwoods. In early spring, these woods, as well as those growing on other acid soils of east Texas, are whitened with flowering dogwood (*Cornus floridana*).

Along the Sabine and Neches rivers, as well as along some of the smaller streams, bayous, and swamps of east Texas, there occur picturesque water forests almost identical with those of Louisiana. These are composed chiefly of such trees as baldcypress (*Taxodium distichum*), swamp hickories (*Carya aquatica* and *C. leiodermis*), water oak (*Quercus nigra*), sweetbay magnolia (*Magnolia virginiana*), sweetgum (*Liquidambar styraciflua*), water tupelo (*Nyssa aquatica*), blackgum (*N. sylvatica*), and water ash (*Fraxinus caroliniana*). In places, these forests are practically without undergrowth; in others, they are furnished with a dense growth of bushes and other vegetation. While the baldcypress is confined mostly to these forests, it extends westward along streams as far as Kerr and Real counties in the center of the state.

An important and characteristic element of the Texas forests is the growth of hardwood trees on the alluvial and eroded bottomlands—sometimes five miles in width—of streams in the eastern half of the state. The timber of such bottomlands (occurring along the Trinity, Red, Sulphur, Neches, and other rivers) is often

heavy, with dense undergrowth, including flourishing vines of poison-ivy (*Rhus toxicodendron*). Although the association of species composing this forest is variable, it includes the more common hardwoods of the eastern United States, such as cottonwood (*Populus deltoides*), hickories (*Carya*), pecan (*C. illinoensis*), black walnut (*Juglans nigra*), hornbeam (*Carpinus caroliniana*), hophornbeam or ironwood (*Ostrya virginiana*), American beech (*Fagus grandifolia*), white oak (*Quercus alba*), southern red oak (*Q. falcata*), overcup oak (*Q. lyrata*), bur oak (*Q. macrocarpa*), water oak (*Q. nigra*), willow oak (*Q. phellos*), black oak (*Q. velutina*), elms (*Ulmus*), bois d'arc or osage orange (*Maclura pomifera*), southern magnolia (*Magnolia grandiflora*), sycamore (*Plantanus occidentalis*), sweetgum, American holly (*Ilex opaca*), linden or basswood (*Tilia americana*), water tupelo, blackgum, ashes (*Fraxinus*), and numerous others. In many parts of the almost treeless coastal prairies these bottomland forests furnish the only timber.

CENTRAL TEXAS WOODS: The western fringe of the eastern forests reaches in a southwesterly direction from the Red River to Zavala County near the Rio Grande and westward to the edge of the Blackland Prairie. It is an area of post oak (*Quercus stellata*) woodlands. This timber also extends westward along the Red River, and thence south in two irregular strips called the Cross Timbers (so-called because they lie across the uplands nearly at right angles to the river valleys, instead of following them). The western or upper Cross Timbers leaves the Red River in Montague County, at the lower edge of which it divides, the eastern portion passing south through Wise and Parker counties to the Brazos River, the western extending to Erath County. The eastern or lower Cross Timbers runs from a point on the Red River in Cooke County south to the Brazos River in McLennan County, a distance of about 140 miles. These Cross Timbers vary in width from 10 to 20 miles and are interspaced in places with small prairies. The principal trees on the uplands are the post oak and blackjack oak (*Quercus marilandica*), with a slight infusion of hickories and other species of hardwoods, while along the streams occur other oaks, pecan, elms, including the cedar elm (*Ulmus crassifolia*), ashes, hackberries (*Celtis*), walnuts, cottonwood, plums (*Prunus*), sycamore, and others. The forest is somewhat open, usually without dense undergrowth except along the streams, and the trees rarely reach such great height or stateliness as in the woods of the eastern bottomlands. This forest type is, however, one admirably adapted to the increased alkalinity and aridity of north central and central Texas.

GULF COAST: The sand and seashell coastal islands of the Gulf of Mexico support only a scanty growth of native vegetation, chiefly hardy grasses and low annuals,

with a few mesquite shrubs and yuccas. Imported saltcedars (*Tamarix gallica*) stand on some islands, especially those on the upper coast. On sand dunes of island and mainland beaches, tall sea-oats (*Uniola paniculata*) gently sway in the prevailing southeast Gulf breeze, pitch in northers, and bend flat in hurricanes. Saltgrass or cordgrass (*Spartina*) grows in the salt marshes; inland from these are freshwater marshes where cattails (*Typha*) predominate. Landward of the dunes, sandy flats support large stands of silver leaf sunflower (*Helianthus argophyllus*); in sand this spectacular plant grows inland as far as Gonzales County.

EDWARDS PLATEAU REGION: One of the most important woodland areas of the state is that covering the Edwards Plateau and a portion of central Texas immediately to the north. This rough region receives too little rain to maintain woods as tall as those of east Texas; consequently its timber is low and in places rather scattered. The most characteristic tree of this region is the Ashe juniper (*Juniperus ashei*)—locally called cedar—which prior to 1933 covered great areas in its so-called “brakes.” The trees are low but wide-spreading, branching near the ground to create a dense growth which is often difficult to penetrate. There are also considerable areas of more open stands of upland, or plateau, live oak (*Quercus fusiformis*) and Texas oak (*Q. texana*). Particularly along streams, grow such trees and shrubs as Mexican walnut (*Juglans microcarpa*), cedar elm, Texas mulberry (*Morus microphylla*), escarpment black cherry (*Prunus serotina* var. *eximia*), Texas redbud (*Cercis canadensis* var. *texensis*), Eve’s necklace (*Sophora affinis*), Texas mountain laurel (*S. secundiflora*), buckeyes (*Aesculus glabra* and *A. pavia*), Spanish buckeye (*Ungnadia speciosa*), and silktassel (*Garrya lindheimeri*). Texas kidneywood (*Eysenhardtia texana*) grows on canyon rims. Frequent on limestone hills are three sumacs—skunkbush (*Rhus aromatica* var. *flabelliformis*), lanceleaf (*R. copallina* var. *lanceolata*), and evergreen (*R. virens*).

BRUSH: Large portions of the Trans-Pecos, as well as those parts of the north central, central, and southern sections of the state that are not prairie or forest, are covered with brush—i.e., a more or less dense growth of scrubby trees and bushes. (This vegetation has been called chaparral, but that term is now reserved by botanists for a different sort of association.) Most of the species are adapted to a semiarid or desert condition, such as exists in these regions. This growth is most luxuriant and characteristic in the southern portion of the state from San Antonio south to the Rio Grande (which area has been termed the Rio Grande Plain or south Texas brush country). Here the mesquite (*Prosopis glandulosa*) is the most conspicuous and numerous species. In addition, the brush is composed of a wonderful variety of shrubs, many of them thorny like

the mesquite. Prominent are granjeno (*Celtis pallida*), agarita (*Berberis trifoliolata*), several species of catclaw (*Acacia*), blackbrush (*A. rigidula*), guayacán (*Porlieria angustifolia*), brazils (*Condalia*), Texas lotebush (*C. obtusifolia*), allthorn (*Koeberlinia spinosa*), coma (*Bumelia angustifolia*), Texas persimmon (*Diospyros texana*), whitebrush (*Aloysia ligustrina*), Spanish dagger (*Yucca treculeana*), and various species of cacti. In many places, the large pricklypear (*Opuntia lindheimeri*, also called *O. engelmanni* var. *texana*), together with other plants, forms practically impenetrable thickets. Gravelly or caliche soil hills are typically covered with the ashen-leaved ceniza (*Leucophyllum frutescens*) which promptly covers itself with lavender flowers after a rain shower in the warmer months. Other limy hills were thickly crowned with guajillo (*Acacia berlandieri* and close relatives). Processed by bees, the blossom nectar of guajillo made Uvalde County honey famous over the nation prior to 1933, starting date for brush clearance subsidized by the U.S. Soil Conservation Service. In the hottest and driest portions of the Texas-Tamaulipas border lives a grayish-leaved shrub with large white flowers; this is the wild olive or anacahuita (*Cordia boissieri*). In low places of brush country ranches grow stands of huisache (*Acacia farnesiana*) and retama (*Parkinsonia aculeata*). Huisache puts on its golden fuzz balls in late winter or early spring; these are so fragrant that they are used for making perfume in France and other countries. The retama is noted for its extremely long blooming season; its yellow flowers appear from early spring to late fall. Occasionally along streams, particularly the larger ones, trees—pecan, hackberries, elms, ashes—similar to those in the eastern part of the state may be encountered. In stream bottoms, live oak (*Quercus virginiana*), anaqua (*Ehretia anacua*), and other trees are often picturesquely vined with mustang grape (*Vitis mustangensis*) and clumped with ballmoss (*Tillandsia recurvata*). Nearer the coast, trees are also decorated with Spanishmoss (*T. usneoides*), and in far south Texas with large ballmoss (*T. baileyi*).

In the Rio Grande delta, now 98 percent cleared, a few native subtropical trees, in addition to mesquite brush, still (early 1970’s) remain. Chief among these is the Texas ebony (*Pithecellobium flexicaule*), a thorny evergreen. Its heavy dark red to purple or brown wood with a blonde sapwood layer is very attractive. Most graceful with its fernlike leaves is another legume, the tepeguaje (*Leucaena pulverulenta*). Sole arborescent palm indigenous to Texas soil is *Sabal texana*. Only about 35 acres of these trees remain in more or less natural condition. Most of these are eight miles southeast of Brownsville on the Rabb Plantation, which was purchased circa 1971 by the National Audubon Society. On the banks of the Rio Grande in Cameron, Hidalgo,

and Starr counties are a few Montezuma baldcypress (*Taxodium mucronatum*). Here this conifer is somewhat cold stunted, but an individual of the species growing at Santa María del Tule, Oaxaca, Mexico, had (in 1920) a trunk diameter of twelve meters, thus probably making it the fattest trunked of all trees.

Westward from the confluence of the Rio Grande and the Pecos, the general appearance of the brush undergoes a decided change. It is lower and more scattered and the dominant species of shrubs are mostly different. Mesquites are still present but much reduced in abundance, height, and leaf size. Many more cacti occur, particularly small forms. Most bizarre are two spineless natives of the southern Big Bend—living rock (*Ariocarpus fissuratus*), noted for its rhinoceros tough hide and rocklike appearance, and peyote (*Lophophora williamsii* var. *echinata*), famous for its hallucinogenic effects when eaten. Various species of strawberry cactus (*Echinocereus*), with their beautiful satiny flowers and sweet tart red fruit, and *Echinocactus*, with its curiously hooked spines, are conspicuous on well-drained soil. The small tasajillo (*Opuntia leptocaulis*) abounds in the western half of Texas; other chollas (*Opuntia*) are similarly widespread but much less numerous. Of the various pricklypears which grow on rocky desert hills near the Rio Grande's great Bend one is especially dramatic. This is *Opuntia macrocentra*; during times of stress, such as extreme drought or cold, the pads which support the two- to five-inch blackish spines turn a deep purple. Yuccas (*Yucca*) and century plants (*Agave*) with their tall flower stalks (which in bud stage resemble huge asparagus tips) tower above the desert scrub in many areas. The agaves grow almost to the summits of the highest peaks of the Davis and Chisos mountains, where they form a distinctive feature of the open forest. On many stony mesas, the little lechuguilla (*A. lecheguilla*), with its tall slender bloom stalks, occupies the ground to the exclusion of practically all other plants. On other hills, Texas sotol (*Dasylirion texanum*) spreads its sawtooth-edged leaves. Locally, the curious resurrection plant (*Selaginella lepidophylla*) is abundant and after a rain unfurls and becomes green. Bare thorny crooked stems of ocotillo or "devil's walkingstick" (*Fouquieria splendens*) give a weird touch to the hilltops. This plant blossoms red in the spring, but usually only wears leaves after a rain. Many square miles of flats are covered with creosotebush (*Larrea divaricata*); its highly aromatic leaves perfume the whole desert after a shower.

TRANS-PECOS MOUNTAINS: The high mountains of western Texas, though rising out of a practically treeless desert plain, support a rather dense, though somewhat scattered forest above 5,000 or 6,000 feet, where rainfall is much greater due to the higher altitude. The

principal trees of the lower and warmer slopes are thick-barked or alligator juniper (*Juniperus deppeana*), oneseeded juniper (*J. monosperma*), pinyon (*Pinus edulis*), gray oak (*Quercus grisea*), and Emory oak (*Q. emoryi*). Other trees of less importance, together with many species of shrubs, grow on the same slopes. The summits and cold canyons have, in addition, some Rocky Mountain trees, chiefly conifers, of which the most important are the yellow or ponderosa pine (*Pinus ponderosa*), limber pine (*P. flexilis*), and red or Douglasfir (*Pseudotsuga mucronata*); also Arizona cypress (*Cupressus arizonica*), which in Texas grows only in the Chisos Mountains. Bigtooth maple (*Acer grandidentatum*), the dominant maple of the Rockies, grows beside streams at high altitudes in all the major mountain groups—Guadalupe, Davis, and Chisos.

PANHANDLE: Inconspicuous, except when wild flowers bloom, is the plant life of the windswept plains of northwestern Texas. Chief vegetation consists of grasses that grow in a semiarid climate; stunted mesquites and other shrubs; hackberries in stream valleys and washes; and cottonwoods beside the broad sandy rivers.

WILD FLOWERS: Texas wild flowers strongly rival Texas birds in attractiveness. In years of good rainfall these bloom, each species in its own season, in all parts of the state but are especially numerous in open and lightly wooded areas. In spring and again in fall, frequently an entire field or slope is brilliantly carpeted with only one or two kinds. Major participants in the annual color show include: white- and pink-flowered rainlilies (*Cooperia*; often included in *Zephyranthes*), blue-eyed-grass (*Sisyrinchium*), larkspurs (*Delphinium*), white, yellow, and magenta prickly-poppies (*Argemone*), wild mustards (*Brassica*), yellow wildindigo (*Baptisia*), bluebonnets (*Lupinus*; the official state flowers are *L. subcarnosus* and *L. texensis*), snow-on-the-mountain (*Euphorbia*), winecups or poppymallows (*Callirhoe*), pink evening-primroses (*Hartmannia*; often included in *Oenothera*), yellow evening-primroses (*Oenothera*), purple eryngo (*Eryngium leavenworthii*), mountain pink (*Erythraea beyrichii*; often included in *Centaurium*), Texas bluebells (*Eustoma*), red, pink, and lavender phlox (*Phlox*), white, yellow, and purple nightshades (*Solanum*), purple verbenas (*Verbena*), scarlet and blue sage (*Salvia*), lemon, green, and purple horsemints (*Monarda*), lavender foxgloves (*Penstemon*), red and orange paintbrushes (*Castilleja*), purple wild petunias (*Ruellia*), red and blue lobelias (*Lobelia*), purple iron-weeds (*Vernonia*), gayfeathers (*Liatris*), yellow broomweed (*Gutierrezia*; often included in *Xanthocephalum*), gumweeds (*Grindelia*), goldenrods (*Solidago*), lazy daisies (*Aphanostephus*), asters (*Aster*), white mountain daisy or hoary blackfoot (*Melampodium cinereum*), yellow Texas-star (*Lindheimera*



Loblolly pine (*Pinus taeda*) forest in piney woods of eastern quarter, Martin Dies, Jr., State Park, Jasper County (photo by Rose Ann Rowlett, 1973)



Hardwood forest of southern magnolia (*Magnolia grandiflora*), sweetgum (*Liquidambar styraciflua*), and associates, Martin Dies, Jr., State Park, Jasper County (photo by Rose Ann Rowlett, 1973)

texana), cut-leaved daisy (*Engelmannia pinnatifida*), gold- and reddish-brown-flowered Mexican-hat (*Ratibida columnaris*), mountain-glow or clothes-of-gold (*Viguiera*), sunflowers (*Helianthus*), goldenwaves (*Coreopsis*), *Thelesperma*, firewheels (*Gaillardia*), Texas thistle (*Cirsium texanum*), and starthistle (*Centaurea americana*).

Most of the aforementioned flowers are widespread over the Lone Star State, but there is one attractive mass bloomer that is practically confined to the south Texas brush country. This is the completely yellow (even the center) huisache-daisy (*Amblyolepis setigera*); like the huisache for which it was named, it is blissfully fragrant.

GRASSES: Native grasses, like wild flowers, are widespread over the state but are scarce in heavy woodlands, in plowed fields, and built-up areas. Likewise, they are reduced on ranches that have been overgrazed for a century. Many Great Plains grasses were adapted to withstand the grazing pressure of vast herds of American bison (buffalo); therefore, they were able to survive when hordes of cattle came in the nineteenth and twentieth centuries. The following list includes

some Texas species important to livestock and plains wildlife. The names are taken from Benjamin Carroll Tharp's study, *Texas Range Grasses*, which was published in 1952.

Sessile-flowered spike grass (*Uniola sessiliflora*), big bluestem (*Andropogon furcatus*), balsam grass (*Elyonurus tripsacoides*), coastal sacahuiste (*Spartina spartinae*), seacoast bluestem (*Andropogon littoralis*), hooded finger grass (*Chloris cucullata*), single-spike paspalum (*Paspalum monostachyum*), hairy triodia (*Triodia pilosa*), Johnson grass (*Sorghum halepense*), hairy grama (*Bouteloua hirsuta*), side-oats grama (*B. curtipendula*), western wheat grass (*Agropyron smithii*), curly mesquite grass (*Hilaria belangeri*), buffalo grass (*Buchloë dactyloides*), purple three-awn (*Aristida purpurea*), knotroot bristle grass (*Setaria geniculata*), eastern gama grass (*Tripsacum dactyloides*), Indian grass (*Sorghastrum nutans*), Virginia bluestem (*Andropogon virginicus*), switch grass (*Panicum virgatum*), Urville's paspalum (*Paspalum urvillei*), carpet grass (*Axonopus compressus*), little bluestem (*Andropogon scoparius*), rescue grass (*Bromus catharticus*), and Texas needle grass (*Stipa leucotricha*).



Old South-style bayou, Orange County; the baldcypress (*Taxodium distichum*) trees draped with Spanishmoss (*Tillandsia usneoides*) (photo by Edgar B. Kincaid, Jr., 1959)



Swamp forest of baldcypress, water hickory (*Carya aquatica*), and water tupelo (*Nyssa aquatica*), Orange County; the baldcypress knees characteristic of southeastern swamps (photo by Edgar B. Kincaid, Jr., 1959)



Hackberry (*Celtis*) woods fringing Colorado River, central prairie region, eastern Travis County; understory plants chiefly poison-ivy (*Rhus toxicodendron*) in foreground and mostly frostweed (*Verbesina virginica*) in background; these plants are widespread in the eastern half of Texas, including the Cross Timbers country of the north central region (photo by Jim Bones, 1967)

Gulf of Mexico surf on northern Padre Island, Nueces County
(photo by Jim Bones, 1966)





Sea-oats (*Uniola paniculata*) atop beach sand dunes, Mustang Island (now adjoined to northern Padre Island), Nueces County (photo by Rose Ann Rowlett, 1973)



Spartina alterniflora salt marsh, Bolivar Peninsula, Galveston County (photo by Suzanne Winckler, 1973)



Brackish pond and live oak (*Quercus virginiana*) motte near Rockport, Aransas County, a locality renowned for water birds and migrating land birds; silver leaf sunflower (*Helianthus argophyllus*) in right foreground (photo by Rose Ann Rowlett, 1973)



Freshwater lake fringed with a marsh of cattails (*Typha*), willow (*Salix*), and lotus (*Nelumbo*), Maner Lake, Brazoria County (photo by Suzanne Winckler, 1973)



Tall-grass coastal prairie, elevation ca. 50 feet, Aransas County, habitat of the rare Attwater's Greater Prairie Chicken (photo by Rose Ann Rowlett, 1973)



Grazed coastal prairie, Galveston County; the mound of trees in background is High Island, a concentration point for migrating land birds (photo by Suzanne Winckler, 1973)



Interior of a live oak motte, Smith Woods at High Island, Galveston County (photo by Suzanne Winckler, 1973)



Nesting habitat of the Golden-cheeked Warbler: an Ashe juniper (*Juniperus ashei*)–Spanish oak (*Quercus texana*) canyon on southeastern Edwards Plateau, Lucas Tract, 600–800 feet, at Austin, western Travis County (photo by Rose Ann Rowlett, 1973)



Nesting habitat of the Black-capped Vireo: a low, dense thicket on limestone hills of southeastern Edwards Plateau, Cat Mountain, ca. 700 feet, near Austin, western Travis County; the senior editor facing white oak shinnery (*Quercus brevifolia*) with scrubby form of live oak behind him (photo by Suzanne Winckler, 1973)



Mesquite (*Prosopis glandulosa*), pricklypear (*Opuntia lindheimeri*), and Spanish dagger (*Yucca treculeana*) growing on flats of south Texas brush country, Live Oak County (photo by Jim Bones, 1973)



Ashen-leaved ceniza (*Leucophyllum frutescens*) growing on hilly terrain of south Texas brush country, Starr County (photo by Jim Bones, 1973)



Grass-mesquite savannah, King Ranch, Kenedy County (photo by Jim Bones, 1973)

Tamaulipan brush along lower Rio Grande, Starr County; anacahuita (*Cordia boissieri*) in flower, a catclaw (*Acacia*) directly behind it, and mesquite in right background (photo by Jim Bones, 1973)







Remnant patch of *Sabal texana* next to a fallow field, near historic Southmost, Cameron County; Kansas sunflower (*Helianthus annuus*) in left foreground and cane (*Arundinaria*) among the palms (photo by Edgar B. Kincaid, Jr., 1956)

Texas ebony (*Pithecellobium flexicaule*) grove—or *ebanale*—with giant Turk's cap (*Malvaviscus grandiflorus*) in lower foreground, Santa Ana National Wildlife Refuge, Hidalgo County (photo by Jim Bones, 1973)

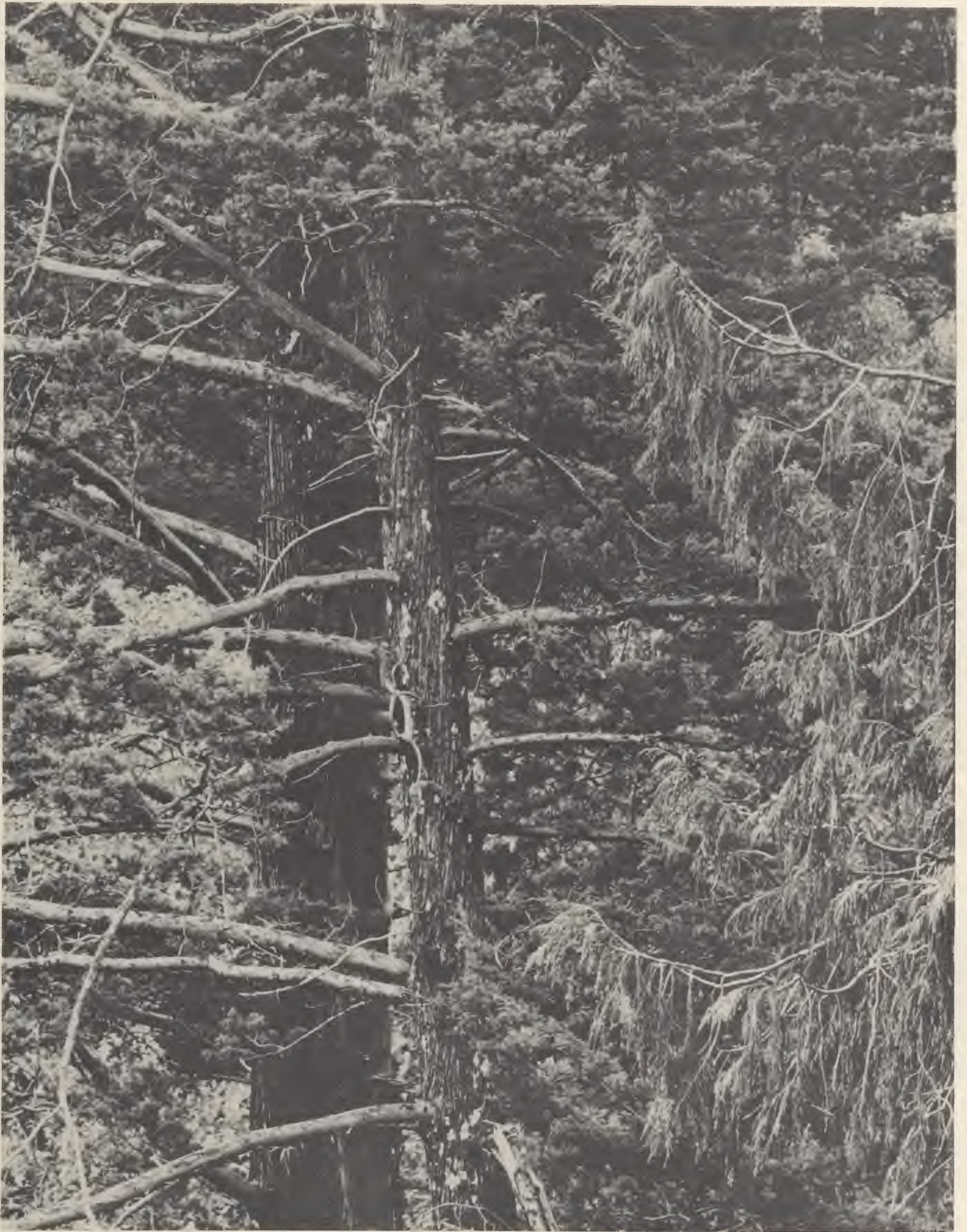


Subtropical vegetation beside lower Rio Grande at Salíñeno, Starr County; tallest trees in right background are Montezuma baldcypress (*Taxodium mucronatum*), one of the few stands left in the United States (photo by Jim Bones, 1973)

Confluence of Tornillo Creek with Rio Grande in southern Trans-Pecos, Big Bend National Park, southern Brewster County (photo by Jim Bones, 1967)







Conifers at Boot Spring, ca. 6,500 feet, Chisos Mountains, Big Bend National Park; Arizona cypress (*Cupressus arizonica*) in center and foliage of drooping, or weeping, juniper (*Juniperus flaccida*) at right (photo by Jim Bones, 1972)

(above, left) Chihuahuan desert flat of creosotebush (*Larrea divaricata*), pricklypear (*Opuntia*), *Yucca*, leatherplant (*Jatropha spathulata*), lechuguilla (*Agave lecheguilla*), and ocotillo (*Fouquieria splendens*), ca. 3,200 feet, near Panther Junction, Chisos Mountains in background, Big Bend National Park (photo by Roland H. Wauer, ca. 1967)

(below, left) Pinyon (*Pinus edulis*)–juniper (*Juniperus*) woodland in Green Gulch, ca. 5,400 feet, Big Bend National Park; sotol (*Dasylirion leiophyllum*) bloom stalk in center foreground and century plant (*Agave scabra*) to the right (photo by Roland H. Wauer, ca. 1968)



Yucca-cholla (*Opuntia*) grassland, ca. 5,300 feet, Davis Mountains, Jeff Davis County; juniper-pinyon-pine-oak woodland growing on Sawtooth Mountain, 7,758 feet, in background (photo by Jim Bones, 1973)

(above, right) Rocky Mountains-style forest, ca. 5,200 feet, McKittrick Canyon, Guadalupe Mountains National Park, northern Culberson County; western yellow pine (*Pinus ponderosa*) is the dominant tree (photo by George A. Newman, 1973)

(below, right) Bigtooth maple (*Acer grandidentatum*) grove, ca. 5,300 feet, McKittrick Canyon, Guadalupe Mountains National Park; basket-grass (*Nolina*) in center (photo by George A. Newman, 1973)





Desert oasis in extreme western Trans-Pecos, Hueco Tanks State Park, El Paso County
(photo by Tom M. Kirksey, 1939)

Sink-type lake—or playa—on Panhandle High Plains, 3,750 feet, Muleshoe National Wildlife Refuge, Bailey County; this refuge, on the Central Flyway, supports tremendous numbers of wintering water birds, including the largest concentration (90,000 to 107,000) of Sandhill Cranes in the United States (photo by Jim Bones, 1973)





Panhandle grassland on rim of Palo Duro Canyon State Park, Randall County
(photo by Jim Bones, 1973)



Panhandle sand shinnery oak (*Quercus havardii*) and sand sagebrush (*Artemisia filifolia*), ca. 2,100 feet, Kent County; these two plants, plus bunchgrass, constitute original habitat of the rare Lesser Prairie Chicken (photo by Jim Bones, 1973)



Cottonwood (*Populus*) grove in northeastern Panhandle along Red Deer Creek, Roberts County; on the more arid portions of the southern Great Plains, as in the flatlands of the Trans-Pecos, cottonwoods are the only large native trees (photo by Jim Bones, 1973)

REGIONAL BIRD LIFE

The diversity of birds found in Texas naturally reflects the extremely varied climate, physiography, and vegetation of the Lone Star State. Each region supports certain species adapted to a particular combination of weather, terrain, and flora, and bird students soon learn to associate these regions with their characteristic avifauna.

One native Texas bird, the Mourning Dove, nests in all land areas of the state. Others—Turkey Vulture, Yellow-billed Cuckoo, Roadrunner (oddly enough), Barn Owl, Screech Owl, Chimney Swift, Scissor-tailed Flycatcher, Purple Martin, Bewick's Wren, Mockingbird, Yellow-breasted Chat, Red-winged Blackbird, Brown-headed Cowbird, Cardinal, Blue Grosbeak, Painted Bunting, and Lark Sparrow—are almost as widespread.

The Green Heron, Chuck-will's-widow, Red-bellied Woodpecker, Great Crested Flycatcher, Acadian Flycatcher, Eastern Wood Pewee, Blue Jay, Common Crow, Carolina Chickadee, Tufted Titmouse, Carolina Wren, Eastern Bluebird, Blue-gray Gnatcatcher, Orchard Oriole, and Indigo Bunting range numerous through the eastern wooded region; the Bronzed Grackle, *Quiscalus aeneus*, though retreating northward as a breeder, is still (1972) abundant during winter in eastern woods and fields. In open or lightly wooded country, the Red-tailed Hawk, Killdeer, Great Horned Owl, Common Nighthawk, Barn Swallow, Eastern Meadowlark, and Dickcissel are widely distributed as nesters; the Western Kingbird, Ashthroated Flycatcher, Bullock's Oriole, and Cassin's Sparrow are general in the western half. In winter, bare, grassy, or weedy ground is taken over by the Horned Lark, Water and Sprague's pipits, Western Meadowlark, and Savannah and Vesper sparrows; and in the northern half of the state, by longspurs, chiefly McCown's and Chestnut-collared. Since the 1930's, the Great-tailed Grackle, *Cassidix mexicanus*, has heavily colonized all more or less open terrain, except portions of the northern Panhandle, east Texas timberlands, and Trans-Pecos deserts. Some birds of more restricted distribution, those characteristic of particular plant associations or larger natural regions are listed following:

WOODED EASTERN UPLANDS: This humid pine-oak region shares with other U.S. Gulf states some peculiar and interesting birds, but most of them are not very common as nesters. Such are the Pileated Woodpecker, *Hylatomus pileatus*; Red-cockaded Woodpecker, *Phrenopicus borealis*, though this highly specialized bird is very localized; Brown-headed Nuthatch, *Sitta pusilla*; Yellow-throated Warbler, *Dendroica dominica*;

Pine Warbler, *Dendroica pinus*; and Bachman's Sparrow, *Aimophila aestivalis*, now local.

EASTERN BOTTOMLANDS AND SWAMPS: Like those of Louisiana, the eastern wooded river valleys have a more numerous bird population than the adjacent uplands, furnishing summer homes for such species as Anhinga, *Anhinga anhinga*; Common Egret, *Casmerodius albus*; Little Blue Heron, *Florida caerulea*; Wood Duck, *Aix sponsa*; Red-shouldered Hawk, *Buteo lineatus*; Barred Owl, *Strix varia*; Ivory-billed Woodpecker, *Campephilus principalis*, now probably extinct; Fish Crow, *Corvus ossifragus*; Wood Thrush, *Hylocichla mustelina*; Prothonotary Warbler, *Protonotaria citrea*; Swainson's Warbler, *Limnothlypis swainsonii*; Worm-eating Warbler, *Vermivora amic*; Parula Warbler, *Parula americana*; Kentucky Warbler, *Oporornis formosus*; Hooded Warbler, *Wilsonia citrina*; and American Redstart, *Setophaga ruticilla*.

COASTAL PRAIRIES: This tall-grass region, particularly in late summer and autumn, swarms with flocks of grackles and other blackbirds; these flocks were like great billows of oil smoke prior to the 1950's, when massive poisoning of rice fields became commonplace. Here also are herons, egrets (the Cattle Egret being most numerous since the 1950's), ibises, and in winter, flocks of geese, ducks, and Sandhill Cranes, *Grus canadensis*. In summer, the coastal prairies provide nesting habitat for such species and subspecies as Attwater's Greater Prairie Chicken, *Tympanuchus cupido attwateri*, though now much reduced; Florida Common Nighthawk, *Chordeiles minor chapmani*; Texas Horned Lark, *Eremophila alpestris giraudi*; and Southern and Rio Grande Eastern Meadowlarks, *Sturnella magna argutula* and *S. m. hoopesi*.

COASTAL MARSHES: The coastal fresh and salt marshes support great flocks of blackbirds and grackles and smaller numbers of other birds in fall and winter. Characteristic breeders of these marshes and mostly confined to them are White-faced Ibis, *Plegadis mexicana*; Fulvous Tree Duck, *Dendrocygna bicolor*; Mottled Duck, *Anas fulvigula*; King Rail, *Rallus elegans*; Clapper Rail, *Rallus longirostris*; Purple Gallinule, *Porphyrola martinica*; Common Gallinule, *Gallinula chloropus*; Louisiana Long-billed Marsh Wren, *Telmato-dytes palustris thryophilus*; Gulf Coast and Rio Grande Red-winged Blackbirds, *Agelaius phoeniceus littoralis* and *A. p. megapotamus*; Boat-tailed Grackle, *Cassidix major*; and Louisiana and Texas Seaside Sparrows, *Thryospiza maritima fisheri* and *T. m. sennetti*. All except the Clapper Rail and Seaside Sparrows prefer fresh marshes for nesting.

COASTAL BEACHES AND ISLANDS: Birds are fairly numerous on the sandy shores of the Gulf coast, especially so when migrants throng there during spring and

autumn. These strips of sand provide breeding areas for many shorebirds and water birds, among which are Brown Pelican, *Leptopelicanus occidentalis*, though it has been practically extirpated since 1960; Olivaceous Cormorant, *Phalacrocorax brasilianus*, it too much reduced; Reddish Egret, *Dichromanassa rufescens*; Roseate Spoonbill, *Ajaia ajaja*; American Oystercatcher, *Haematopus palliatus*; Snowy Plover, *Leucopoliis alexandrinus*; Wilson's Plover, *Pagolla wilsonia*; Willet, *Catoptrophorus semipalmatus*; Laughing Gull, *Larus atricilla*; Gull-billed Tern, *Gelochelidon nilotica*; Forster's Tern, *Sterna forsteri*; Eastern Least Tern, *Sterna albifrons antillarum*; Royal Tern, *Thalasseus maximus*; Sandwich Tern, *Thalasseus sandvicensis*; Caspian Tern, *Hydroprogne caspia*; and Black Skimmer, *Rynchops nigra*. Here too, as on the coastal marshes and prairies, a number of northern breeders—various species of ducks, sandpipers, etc.—linger through the summer without nesting. The most renowned bird of winter on the Gulf coast is the Whooping Crane, *Limnogeranus americanus*, which spends the cold months at Aransas National Wildlife Refuge.

EDWARDS PLATEAU: Except for flocks of the Field Sparrow, *Spizella pusilla*, and Slate-colored Junco, *Junco hyemalis*, during winter, birds are not particularly numerous in the broken juniper-oak country along the southern and eastern edges of the Edwards Plateau. However, several interesting species and subspecies occur here, several of which are restricted to this region during the nesting season: Green Kingfisher, *Chloroceryle americana*, also found in south Texas; Vermilion Flycatcher, *Pyrocephalus rubinus*, also a bird of the brush country and western deserts; Coahuila Cave Swallow, *Petrochelidon fulva pallida*; Texas Scrub Jay, *Aphelocoma coerulescens texana*; Texas Canyon Wren, *Catherpes mexicanus polioptilus*; Rock Wren, *Salpinctes obsoletus*, also widespread in arid portions of the state; Black-capped Vireo, *Vireo atricapillus*; Golden-cheeked Warbler, *Dendroica chrysoparia*; House Finch, *Erythrura mexicana*, also a bird of Trans-Pecos deserts and mountains; Arkansas Lesser Goldfinch, *Spinus psaltria psaltria*, also found in Trans-Pecos mountains; Texas Brown Towhee, *Hortulanus fuscus texanus*; and Rock Rufous-crowned Sparrow, *Aimophila ruficeps eremoeca*, which also occurs in southern Trans-Pecos.

SOUTH TEXAS BRUSH COUNTRY: In the thornbrush country, birds are fairly numerous and generally distributed. Characteristic species and subspecies include Least Grebe, *Limnodytes dominicus*; Harris' Hawk, *Parabuteo unicinctus*; Caracara, *Caracara plancus*; Texas Bobwhite, *Colinus virginianus texanus*; Chestnut-bellied Scaled Quail, *Callipepla squamata castanogastris*; Rio Grande Wild Turkey, *Meleagris gallopavo intermedia*, which is also found on the Edwards Pla-

teau; Eastern White-winged Dove, *Melopelia asiatica asiatica*; Mexican Ground Dove, *Columbigallina passerina pallescens*; Inca Dove, *Scardafella inca*; Texas Roadrunner, *Geococcyx californianus dromicus*; Texas Screech Owl, *Otus asio mcallii*; Pauraque, *Nyctidromus albicollis*; Wagler's Golden-fronted Woodpecker, *Centurus aurifrons aurifrons*; Texas Ladder-backed Woodpecker, *Dryobates scalaris symplectus*; Wied's Crested Flycatcher, *Myiarchus tyrannulus*; Black-crested Titmouse, *Baeolophus atricristatus*, also characteristic of Edwards Plateau and Trans-Pecos mountains; Verdin, *Auriparus flaviceps*, also a bird of western deserts; Northern Cactus Wren, *Campylorhynchus brunneicapillus couesi*; Long-billed Thrasher, *Toxostoma longirostris*; Brownsville Curve-billed Thrasher, *Toxostoma curvirostris oberholseri*; Rio Grande White-eyed Vireo, *Vireo griseus micrus*; Northern Bell's Vireo, *Vireo bellii bellii*; Red-eyed Bronzed Cowbird, *Tangavivus aeneus aeneus*; Texas Pyrrhuloxia, *Pyrrhuloxia sinuata sinuata*, which is also found in portions of the Panhandle and Trans-Pecos; Olive Sparrow, *Arremonops rufivirgatus*; and Texas Black-throated Sparrow, *Amphispiza bilineata bilineata*.

RIO GRANDE DELTA: A decided infusion of Mexican tropical species enriches the Rio Grande delta. Specialties which breed in this area include White-tailed Kite, *Elanus leucurus*, although it currently (early 1970's) appears to be expanding its range; White-tailed Hawk, *Tachytriorchis albicaudatus*; Chachalaca, *Ortalis vetula*; Jacana, *Asarcia spinosa*, which, however, presently (1972) is more regular on the upper coast; Red-billed Pigeon, *Chloroenas flavirostris*; White-fronted Dove, *Leptotila verreauxi*; Groove-billed Ani, *Crotophaga sulcirostris*; Ferruginous Owl, *Glaucidium brasilianum*; Texas Elf Owl, *Micropallas whitneyi idonea*; Buff-bellied Hummingbird, *Amazilia yucatanensis*; Ringed Kingfisher, *Megaceryle torquata*; Couch's Tropical Kingbird, *Tyrannus melancholicus couchii*; Kiskadee Flycatcher, *Pitangus sulphuratus*; Beardless Flycatcher, *Camptostoma imberbis*; Green Jay, *Xanthoeca yncas*; Tamaulipas Mexican Crow, *Corvus imparatus*, present, though as yet (1972) not nesting, in Brownsville region since 1968; Olive-backed Warbler, *Parula pitaiayumi*, although much reduced since 1951; Black-headed Oriole, *Icterus graduacaudus*; Sennett's Hooded Oriole, *Icterus cucullatus sennetti*; Lichtenstein's Oriole, *Andriopsar gularis*; Varied Bunting, *Linaria versicolor*, also found in the Big Bend; White-collared Seedeater, *Sporophila morelleti*, though nowadays (1972) very rare; and Botteri's Sparrow, *Aimophila botterii*.

DESERTS: The arid and semiarid regions of west Texas support an avifauna relatively poor in number of individuals, though birds are more numerous near water. Characteristic of this region are Mexican Duck,

Anas diazi; Arizona Scaled Quail, *Callipepla squamata pallida*; Gambel's Quail, *Lophortyx gambelii*, now restricted to El Paso region; Western White-winged Dove, *Melopelia asiatica mearnsi*; Black-chinned Hummingbird, *Archilochus alexandri*, also characteristic of the Edwards Plateau; Black Phoebe, *Sayornis nigricans*; Say's Phoebe, *Sayornis sayus*; White-necked Raven, *Corvus cryptoleucus*; Arizona Cactus Wren, *Campylorhynchus brunneicapillus anthonyi*; Black-tailed Gnatcatcher, *Poliophtila melanura*; Texas Bell's Vireo, *Vireo belli medius*; Gray Vireo, *Vireo vicinior*; Mexican and Arizona Hooded Orioles, *Icterus cucullatus cucullatus* and *I. c. nelsoni*; Scott's Oriole, *Icterus parisorum*; Cooper's Summer Tanager, *Piranga rubra cooperi*; Beckham's Pyrrhuloxia, *Pyrrhuloxia sinuata beckhami*, found in northwestern Trans-Pecos; Canyon Brown Towhee, *Hortulanus fuscus mesoleucus*; and Desert and Chisos Black-throated Sparrows, *Amphispiza bilineata deserticola* and *A. b. dapolia*.

TRANS-PECOS MOUNTAINS: Birds are fairly common in the high mountains of the Trans-Pecos, except during winter. Here nest such interesting Rocky Mountain and/or Sierra Madre species as Zone-tailed Hawk, *Buteo albonotatus*; Golden Eagle, *Aquila chrysaetos*; Harlequin Quail, *Cyrtonyx montezumae*; Band-tailed Pigeon, *Chloroenas fasciata*; Flammulated Scops Owl, *Otus scops flammeolus*; Stephen's Whip-poor-will, *Setochoalcis vocifera arizonae*; White-throated Swift, *Aeronautes saxatalis*; Lucifer Hummingbird, *Calothorax lucifer*, a specialty of southern Big Bend; Broad-tailed Hummingbird, *Platurornis platycercus*; Blue-throated Hummingbird, *Lampornis clemenciae*; Acorn Woodpecker, *Balanosphyra formicivora*; White-breasted Hairy Woodpecker, *Dryobates villosus leucothorectis*; Cassin's Kingbird, *Tyrannus vociferans*; Western Flycatcher, *Empidonax difficilis*; Western Wood Pewee, *Contopus sordidulus*; Violet-green Swallow, *Tachycineta thalassina*; Steller's Jay, *Cyanocitta stelleri*; Pecos Scrub Jay, *Aphelocoma coerulescens mesolega*; Couch's Mexican Jay, *Aphelocoma ultramarina couchii*, normally found only in the Chisos Mountains; Common Raven, *Corvus corax*; Mountain Chickadee, *Parus gambeli*; Lead-colored and Black-eared Bushtits, *Psaltiriparus*, both forms found also in portions of Edwards Plateau; Rocky Mountain White-breasted Nuthatch, *Sitta carolinensis nelsoni*; Pygmy Nuthatch, *Sitta pygmaea*; Hermit Thrush, *Hylocichla guttata*, nesting only in the Guadalupe Mountains; Western Bluebird, *Sialia mexicana*, also regular only in the Guadalupe; Hutton's Vireo, *Vireo huttoni*; Colima Warbler, *Helminthophila crissalis*, the nesting specialty of the Chisos Mountains; Audubon's Warbler, *Dendroica auduboni*, with nesting confirmed only in the Guadalupe; Grace's Warbler, *Dendroica graciae*, also found breeding only in the Guadalupe; Painted Redstart, *Setophaga picta*, a rare

breeder restricted to the Chisos Mountains; Western Tanager, *Piranga ludoviciana*, nesting regularly only in the Guadalupe; Hepatic Tanager, *Piranga flava*; Black-headed Grosbeak, *Pheucticus melanocephalus*; Green-tailed Towhee, *Oberholseria chlorura*; and Black-chinned Sparrow, *Spizella atrogularis*.

PANHANDLE AND ASSOCIATED PLAINS: Birds in this semiarid short-grass region are not common except in the vicinity of streams, ponds, and lakes, where Killdeer, other plovers, and water birds sometimes congregate. The characteristic summer species and subspecies of these northern plains are Mississippi Kite, *Ictinia mississippiensis*; Lesser Prairie Chicken, *Tympanuchus pallidicinctus*, though it is now extremely localized; Killdeer, *Oxyechus vociferus*; Long-billed Curlew, *Numenius americanus*, now irregular and local as a nester; Burrowing Owl, *Speotyto cunicularia*; Howell's Common Nighthawk, *Chordeiles minor howelli*; Saskatchewan Horned Lark, *Eremophila alpestris enthymia*; Common Eastern Meadowlark, *Sturnella magna magna*; and Western Meadowlark, *Sturnella ludoviciana*.

CHANGES IN BIRD LIFE

Vegetative cover of the land is continually undergoing change. Since any change within a given plant community affects the bird life adapted thereto, it is well to examine the causes of change.

Under favorable conditions, plant species tend to expand their geographical ranges until advance is blocked by bodies of water, mountain ranges, deserts, unsuitable soil, etc. Chief factors which control the composition and maintenance of plant communities are temperature, humidity, moisture, light, evaporation, and soil characteristics. Most plants are adapted to alkaline or to acid soil, but not to both types.

Established plant populations are subject to alteration by various destructive scourges of an intermittent, cyclic, or accidental nature. An outbreak of pernicious insects may so ravage a plant species—or an entire community—that certain plants are virtually exterminated and habitat permanently altered over a considerable area. Grasshoppers, army worms, forest tent caterpillars, and various imported pests, such as gypsy and brown-tailed moths, are insects with this potential. Fungus and other plant diseases often cause great destruction and sometimes bring about drastic changes in the ecology. The most spectacular example is the Asiatic chestnut blight which annihilated the native American chestnut tree (*Castanea dentata*) soon after the fungus arrived at the port of New York City in 1904. The loss of the world's tastiest nut was a disaster

for gourmets, squirrels, and other wildlife. However, it was not a cause of the extermination of the Passenger Pigeon, as is sometimes alleged, because the Pigeon was already extinct in the wild when the chestnut blight arrived.

Drought, particularly if prolonged, is a very disruptive element in humid or semihumid land regions, and, while it usually has little effect on the forest, it often eliminates, at least temporarily, many of the succulent plants. A prolonged and severe drought has a still more disastrous effect on swamps, marshes, streams, and lakes, often destroying the plants dependent upon much water.

Gradual drying on a large scale is illustrated by the plight in west Texas. For years many localities have seen a steady increase in human population, with consequent draining of natural lakes and ponds and breaking up of grassy prairies for cultivation of crops. Water tables are dropping sharply as subterranean sources are tapped to meet urban water consumption and rural irrigation needs. Addition to water supplies from artificial reservoirs has failed to keep pace with the depletion of subsoil reserves. Effect of the water crisis on native vegetation is quite serious in some areas, and there is every reason to believe that this process of desiccation will continue—the more so since during most of the twentieth century a general climatic warming has been involved, in addition to the changes directly wrought by man.

Flooding is an ever present danger, and its results sudden and devastating; a severe flood may carry off all plant life as well as the supporting topsoil. This happens commonly to such areas as the bottomlands of rivers, and much of this destruction is irreparable.

Storms and accompanying wind often destroy large areas of forest. Such storms are especially disastrous to the live oak mottes of the coastal plain. A tornado can have similar, though localized, effect on pine and other woodlands. The effect of storms upon brushy vegetation is much less marked, but growth of succulent annuals and other small plants is often retarded by storms that deposit deep layers of mud or sand.

Fire can be one of the most devastating agents to forest and thicket, especially where there is a thick layer of dry leaves and branches on the ground. Forest areas completely burned often lie bare for many years, and the succeeding woody growth usually consists of different species than those destroyed. Thickets and brushlands are often eliminated just as completely. Fire has less effect on grasses, since they quickly reseed themselves; and the same applies to marsh vegetation.

Man undoubtedly has been the principal agent in alteration of vegetative cover. He disrupts plant communities through lumbering, burning and cut-

ting trees, mechanical and chemical brush clearing, plowing of grasslands, draining of lakes, marshes, and swamps, construction of reservoirs, buildings, and roads, and innumerable other enterprises that serve his needs at the expense of a balanced ecology. In planting orchards, shade and ornamental trees, truck gardens, and commercial crops, man not only has upset normal plant interrelationships and invited the incursion of disturbance species, but also has introduced exotic plants and animals, which may eventually supplant native species. Of the animals which man has transported everywhere the two most destructive to habitats are goats and sheep. The first animal destroys young trees and thickets, and the latter, especially in dryish Texas-like climates, eliminates grass turf. In accommodating himself, man has laid out sprawling communities wherein native habitat pockets remain only—if at all—in parks, greenbelts, and along watercourses. These smog-shrouded, trash-cluttered, highly polluted urban complexes are joined by a network of equally unnatural and unwholesome roads. This ongoing syndrome has wrought obvious and often irreversible environmental changes in the world, including the Lone Star State.

Since bird life is so intimately dependent upon vegetation for food, shelter, and nest material, it follows that alterations in plant life of a region inevitably cause changes in avifauna—either in appearance or disappearance of species; increase or decrease in numbers; or—rarely—changes in habit of a species to meet changes in its environment.

Changes in forest and other vegetation have a natural tendency to drive away large wary birds, such as hawks and eagles, which require and defend large territories and which have a low toleration to disturbance by man. Conversely, such changes often provide habitat suitable for new species. Some changes in vegetation are not great enough to eliminate species or to attract others, but cause diminution or increase in numbers. This is, in fact, the effect most often observed.

Many species of birds dependent on certain factors within an environment are unable to adapt to new or altered conditions; this is particularly true of various water birds and many strictly forest species. Dependency may be based either upon certain plants within a plant community (e.g., the Golden-cheeked Warbler's reliance on *Juniperus ashei* and *Quercus texana*) or on a certain stage of growth (e.g., the Ivory-billed Woodpecker's need for large, standing, recently dead or dying bottomland trees).

It is important to note that a radical alteration of the breeding or feeding habitat of a species in one association often eliminates it as well from an adjoining association. For instance, a shorebird or other water bird which nests on grassy prairie and feeds on



Panhandle cottonfield, Swisher County; in all portions of the state, agriculture, especially cotton production, has drastically changed the bird life of Texas (photo by Jim Bones, 1973)



Grounds of City Hall, Houston, Harris County, an urban park which harbors migrating land birds; urbanization of Texas has, however, reduced space for native breeding birds (photo by Suzanne Winckler, 1973)



Brownsville Garbage Dump, Cameron County; this and other dumps are important foraging grounds for scavenger birds—Cattle Egret, gulls, ravens, crows, Great-tailed Grackle, others; from 1968 into 1970's, the Brownsville Dump became famous as the only locality in the United States which supported a more or less regular flock of Tamaulipas Mexican Crows (photo by John Arvin, 1973)



Platt Sewage Evaporation Ponds, eastern Travis County; this and other sewage ponds are prime places to observe migrating and wintering water birds (photo by Rose Ann Rowlett, 1973)

the beach would disappear from both associations were either, for any reason, made unsuitable.

Cultivation of land may, at least for a time, attract increased numbers of some species. During the first half of the twentieth century there was no more conspicuous example of this than the rice fields of the Texas coastal prairies. These marshlike fields drew multitudes of Red-winged Blackbirds, Brewer's Blackbirds, grackles, Brown-headed Cowbirds, and great numbers of herons, egrets, ibises, geese, ducks (especially the Fulvous Tree Duck), and rails.

However, the massive poisoning of rice fields that started in the 1950's has now (early 1970's) considerably thinned the clouds of water birds and blackbirds. Grackles, plus the Cattle Egret, currently feed frequently on table scraps picked up in municipal garbage dumps. Since 1968, the Brownsville Dump has been famous among North American bird watchers as supporting the only more or less regular flock of Tamaulipas Mexican Crows in the U.S.A.

A few species take so readily to the advent of man that they have even changed their breeding habits and now nest often or exclusively about his habitations, barns, and bridges. Conspicuous among such species are Chimney Swift, Barn Swallow, Cliff Swallow, Purple Martin, Bewick's Wren, Carolina Wren, and Eastern Bluebird. However, the bluebird, notably since the late 1950's, has been suffering from heavy confiscation of nest holes by the Starling and House Sparrow—two Old World species adapted through thousands of years to man's civilization.

Some changes in bird life are not attributable to alteration of habitat. Of these there are at least four direct causes—natural enemies, disease, agricultural and industrial pollution, and hunting.

The natural enemies of birds are chiefly mammals (including particularly domestic and feral cats) and rapacious birds, although snakes, turtles, ants, and other animals take some toll. However, it is seldom, if ever, that a species is exterminated through the

agency of its natural enemies, though these enemies often greatly reduce its numbers, particularly within localized areas.

Diseases sometimes deplete the ranks of birds, but rarely have a disastrous effect upon a species as a whole, at least not in a continental area like Texas.

In recent years, notably since the mid-1950's, accumulations of agricultural and industrial chemicals in the environment are proving to have a decimating effect on numerous species of birds, particularly those at the ends of food chains, such as the raptors and fish eaters; earthworm- and insect-eating birds have also been damaged. A very noticeable reduction in abundance of numerous Texas species, especially of those types mentioned above, has occurred since World War II when DDT and other insecticides, fungicides, herbicides, and defoliants began to be used extensively. Unless such poisons are soon strictly controlled, their use may prove to be the most important single factor in the reduction of birds.

The hunter who pursues birds for food, sport, or for plumage has caused considerable reduction of birds in Texas. Two species have become extinct largely by this means—the Passenger Pigeon and Carolina Parakeet. In addition, the Eskimo Curlew has been teetering on the brink of extinction throughout the twentieth century, following heavy gunning in the nineteenth century. Others which have been very much depleted by hunting are Whistling and Trumpeter swans, Greater and Lesser prairie chickens, Wild Turkey (especially the eastern race, *M. g. silvestris*), and Whooping Crane. Shooting has also had a decided adverse effect on the Brown Pelican, various species of geese, ducks (especially the Wood Duck), plovers (especially the Golden Plover), and curlews and sandpipers (especially the Upland Plover), and the Ivory-billed Woodpecker. In the late nineteenth and early twentieth centuries, none suffered more than herons, egrets, Roseate Spoonbill, gulls, and terns, which were relentlessly pursued by plume hunters.

Loons: Gaviidae

COMMON LOON, *Gavia immer* (Brünnich)

SPECIES ACCOUNT

Great Northern Diver of Old World authors. A large, hefty-headed loon with straight, comparatively heavy, daggerlike black bill (brownish gray or blue-gray in young bird). Swims low in water like cormorant but usually keeps bill parallel with surface (instead of uptilted). *Nuptial adult*: greenish- to bluish-glossed black head and neck; vertical black and white streaks form tiny throat-patch and narrow necklace, the latter usually broken on fore- and hindneck; black back and scapulars, liberally checkered with large white squares; black wings, sides, and flanks, all with numerous white dots; white chest, laterally lined with black; clear white breast and belly. *Winter adult*: grayish black above; white around eye, and on cheeks, throat, foreneck, chest, breast, belly. Length, 31¼ in.; wingspan, 4½ ft.; weight, 8 lbs.

RANGE: Aleutians and mainland Alaska, n. Mackenzie, Baffin Island, Greenland (mainly coastal regions), Iceland, and Bear Island, south to Washington, n.e. California, n. Montana, Wisconsin, s.e. Ontario, New Hampshire, Maine, Nova Scotia, and Newfoundland. Winters chiefly coastally from Aleutians to c. Baja California and Sonora, and from Newfoundland to Florida, Texas, and Tamaulipas; also Great Lakes.

TEXAS: (See map.) *Winter*: Late Oct. to late Apr. (extremes: Sept. 11, June 10). Irregularly common to uncommon on upper coast; locally fairly common to scarce on central coast; scarce to rare on lower coast. Uncommon as a migrant over remainder of state; individuals rarely overwinter on a few large inland lakes. *Summer*: Casual lingerer in coastal bays (at least 8 records); one inland occurrence: Lubbock (1 present throughout July, 1966, M. K. Rylander).

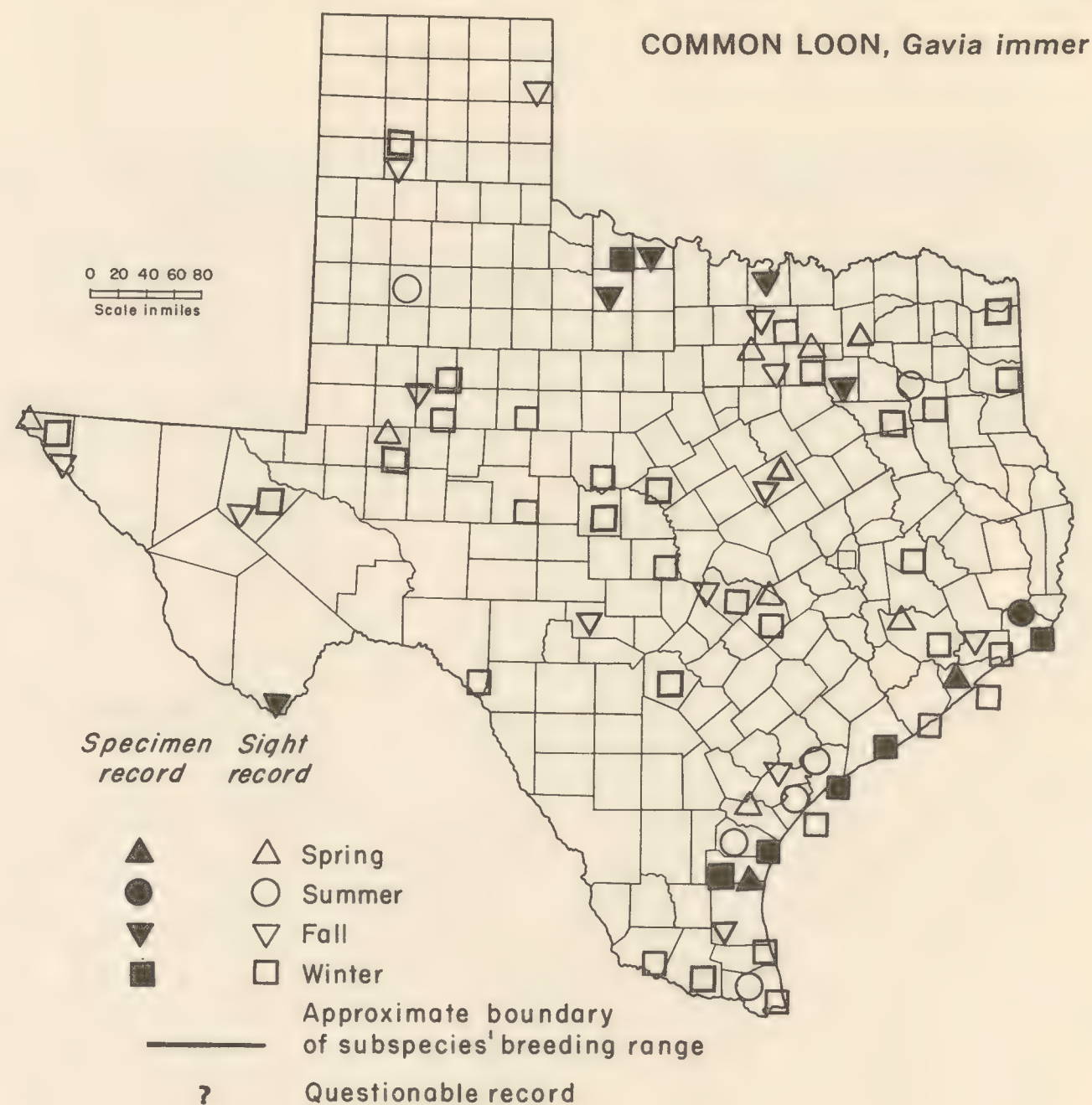
HAUNTS AND HABITS: The Common Loon is the first species of the first family of U.S. birds; however, if and when an American Ornithologists' Union check-list includes all of the North American continent, five tinamous (Tinamidae) will come before the loons. The Great Northern Diver is the second largest and the southernmost breeder of the four members of Gaviidae.

Remote lakes in boreal forests and, to a lesser extent, on tundra are nesting habitat for the Common

Loon. To accommodate the species, waters must be deep enough for diving and expansive enough for nuptial season display and flight takeoff, with suitable shoreline for nest sites. The shallow nest scrape, matted slightly with vegetation, is placed as near water as possible, on islets, sheltered bays or coves, or sometimes on low promontories; evidently a nest is often used year after year by the same pair. The standard clutch is two eggs. Within a day or two of hatching, chicks are swimming; however, when permitted, they ride on either parent's back until two or three weeks of age.

Hard frosts of autumn prod *Gavia immer* to fly southward. A relatively short migration takes most individuals from Canada to the Pacific, Gulf, and Atlantic coasts of the United States. Inland, migrants at times fly at altitudes over 1,500 feet; coastally, they move either low or quite high over the water. The Common Loon, though characteristically alone or paired, at times migrates in small groups of three to fifteen. After the marine coast winter, birds begin returning north by late March.

Flight on pointed wings is powerful with quick



wing-beats uninterrupted by glides; this loon has been clocked at 60 to 62 m.p.h. Takeoff—always from water, and normally into the wind—is a labored, flapping run along the surface for twenty yards to half a mile. On the wing, a loon holds its neck and feet stretched out fore and aft, but the neck droops somewhat; seemingly its head is too heavy to be carried level with body and feet. Barring accidents, a loon always alights on water. The bird descends fast and hits the surface hard with its breast, sending up a shower of spray. Loons are superb surface divers and underwater swimmers. The present species is said to be able to reach an extreme depth of two hundred feet in 1½ minutes. When submerged, it propels itself largely with its big webbed feet, but uses its wings occasionally in a rapid burst or to execute a turn. Unlike most flying birds, loons do not have hollow, air-filled bones. Thus, on top of the water they float long-bodied and low, like surfaced submarines; the extra weight allows gaviids to sink very rapidly.

In underwater chases the loon easily overtakes most fish and grabs them with its bill. A few forms eaten in fresh water include suckers (*Catostomidae*), minnows (*Cyprinidae*), yellow perch (*Perca flavescens*), sunfish (*Lepomis*), crappie (*Pomoxis*), black bass (*Micropterus*), pike (*Esox*), bullhead (*Ameiurus*); in salt water, flounder (*Bothidae*), herring (*Clupea*), killifish (*Fundulus*), menhaden (*Brevoortia*), and sculpin (*Leptocottus*). Crustaceans—crayfish, shrimp, crabs—comprise the next important forage food; snails, leeches, frogs, and salamanders are miscellaneous items. Aquatic plants, consumed in variable amounts, are usually parrotfeather (*Myriophyllum*), pondweed (*Potamogeton*), and algae (*Vaucheria*).

On land, the Common Loon is practically helpless. Legs placed far back on the body are excellent for diving but nearly useless for walking; this loon must grope along by shoving on its breast, wings at times used as props; sometimes it shuffles on its tarsi for short distances in semi-erect posture. The bird cannot take flight from land.

The wild calls of *Gavia immer* rank with howls of the timber wolf as the most eerie and thrilling sounds of the North Woods lake country. Both mammal and bird often call at night; sometimes glowing streamers and curtains of the Aurora Borealis enhance these concerts. This loon's vocalizations, most of which are delivered from water's surface, have been grouped into four basic types (O. A. Austin, Jr.). The bird's tremulous laugh is a rapid three- to eight- or ten-note cry of even intensity. This, the most common vocalization, is sounded apparently on numerous occasions—in protest, alarm, recognition, etc. The loon's yodel, uttered separately or as a preface to the tremolo, is a variation of *a-a-whoo-quee-quee-whe-oooo-quee* repeated five or six times. It is heard in early summer at sunset and at night and is probably of importance in nuptial performance. An outburst of yodeling by one bird often stimulates replies from other loons. A drawn-out wail, rising then falling in pitch, is an *ahaa-*

ooo-ooooo, ooooo-ooo-ahh; like the yodel, it is extremely variable. This call, heard on summer nights, may precede the yodel or the tremolo but is evidently never given in flight. The final category comprises "talk" notes of conversational nature. The most frequently sounded is a hoot; another, issued on the wing, is described variously as *cup, kuk, kwuck*, and *gek-gek*.

The champion yodeler of the great North is largely silent on Texas wintering waters. Individual Common Loons, like many other water birds, tend to linger through spring into summer. Some even attain full breeding plumage without calling much or nesting any. Nobody seems to have offered a good explanation for the fact that many individuals of aquatic species, both large and small, seem to be less interested in breeding than land birds.

CHANGES: Common Loon numbers have not increased, but the species is nowadays seen more frequently on inland Texas lakes. Beginning in the 1920's and reaching full frenzy in the 1950's and 1960's, dams were built on all major rivers in the eastern half of Texas—on the Red, Sabine, Angelina, Neches, Trinity, Brazos, Guadalupe, San Antonio, Medina, Nueces, and Rio Grande. The dams created many artificial lakes; these large, open, wind-swept, fish-stocked reservoirs provide good migration stopovers and even winter habitat for *Gavia immer*.

It is amusing to stand midway on Falcon Dam (Starr Co.) with one eye in Texas and the other in Tamaulipas, and watch a Common Loon swim, taxi, or fly from the United States into Mexico. As yet, most bird books do not allow any species of loon to enter eastern Mexico.

DETAILED ACCOUNT: TWO SUBSPECIES

GREATER COMMON LOON, *Gavia immer immer* (Brünnich)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Acquired by prenuptial molt from winter plumage. Head and neck black, glossed with green, blue, or purple; small patch on throat and broad interrupted collar both of conspicuous white streaks; rest of upper parts, sides, and flanks black, slightly glossed with greenish, with quadrate white spots on back and scapulars and roundish white spots elsewhere; wings and tail chaetura black; sides of jugulum black, heavily streaked with white; remaining lower parts white with band of chaetura black crossing anterior part of crissum; crissum white, somewhat mixed with chaetura black posteriorly. Bill black or blackish slate but olive gray at tip; iris carmine, brick red, or brazil red; legs and feet above plumbeous, below and on inside tinged with yellowish flesh color, or dull white mottled with black; claws black at tips, cinereous at base; webs of toes black, or white and becoming pearl gray and black toward toes. *Adults, winter*: Acquired by complete postnuptial molt. Upper parts chaetura black, hind-neck chaetura drab; mantle with feathers squarish at ends and with rather indistinct markings, not edgings, of deep neutral gray; sides and flanks fuscous, margined with paler; chin and throat white. Bill black; iris reddish brown. *Second nuptial*: Acquired by prenuptial molt from second winter. Similar to nuptial adults but duller, more brownish, often with white on chin and throat. Bill black. *Second winter*: Acquired by complete postnuptial molt from first nuptial. Similar to adults in winter but lighter above; feathers more rounded at tips and with broad

gray edgings. Bill pale grayish, culmen and maxilla blackish slate, tip paler. *First nuptial*: Acquired by wear from first winter. Similar to first winter but paler, light edgings of feathers of upper surface more whitish and narrow; throat more purely white. Bill darker. *First winter*: Identical with juvenal. *Juvenal*: Acquired by complete postnatal molt. Anterior upper parts hair brown, somewhat darker on crown; rest of upper parts fuscous with broad light neutral gray or neutral gray margins on much-rounded feathers, these edgings most conspicuous on mantle; wings and tail plain fuscous or fuscous black; lesser and median coverts hair brown, broadly edged with pale gray or whitish; sides and flanks light hair brown; rest of lower parts white, finely mottled on throat, jugulum, and anterior part of crissum with hair brown, drab, or chaetura drab. Bill pale yellowish green, culmen and tip of maxilla grayish brown; iris brown; feet brownish, externally pale yellowish, internally flesh color.

MEASUREMENTS: *Adult male*: Wing, 344.9–398.0 (average, 364.5) mm.; tail, 59.9–75.9 (66.3); bill (exposed culmen), 73.2–95.8 (85.3); height of bill at base, 23.4–30.5 (26.7); tarsus, 81.3–100.1 (95.5); middle toe without claw, 97.1–113.0 (104.4). *Adult female*: Wing, 329.9–378.0 (343.2); tail, 57.9–78.0 (66.0); bill, 71.0–90.2 (80.7); height of bill, 22.1–28.2 (25.1); tarsus, 81.8–98.8 (91.2); middle toe, 93.0–106.9 (100.3).

RANGE: Aleutians, n.w. Alaska, n. Baffin Island, and coastal Greenland; also Iceland and Bear Island. Winters coastally in e. Pacific and w. and e. Atlantic; in North America, from Aleutians to s. California, and from Newfoundland to Florida and Texas (casually).

TEXAS: *Winter*: One specimen: Calhoun Co., s.w. Matagorda Island (Dec. 8, 1936, A. R. Hines; identified by H. C. Oberholser).

LESSER COMMON LOON, *Gavia immer elasson* Bishop

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Like *G. i. immer* but smaller.

MEASUREMENTS: *Adult male*: Wing, 316.9–339.3 (average, 327.7) mm.; tail, 48.0–72.4 (59.9); bill (exposed culmen), 74.9–85.3 (79.7); height of bill at base, 22.4–25.1 (24.1); tarsus, 80.2–98.8 (88.6); middle toe without claw, 93.7–105.6 (99.8). *Adult female*: Wing, 297.2–323.3 (310.4); tail, 51.6–77.5 (62.0); bill, 68.3–78.2 (73.7); height of bill, 21.4–23.4 (22.1); tarsus, 77.5–84.8 (81.5); middle toe, 86.4–93.2 (89.7).

RANGE: W. British Columbia to n. Ontario, south to n. California, n. Montana, Great Lakes region, and Nova Scotia. Non-breeders summer casually in California, Gulf coast, and Carolinas. Winters coastally from s. British Columbia to c. Baja California and Sonora, and from s. Maine to Florida and Texas.

TEXAS: *Winter*: Taken north to Wilbarger and Cooke (Nov. 4), east to Jefferson, south to Matagorda, west to Brewster (Oct. 19) cos. *Summer*: One specimen: Jefferson Co., 6 mi. east of High Island (July 9, 1938, Corrie Hooks).

ARCTIC LOON, *Gavia arctica* (Linnaeus)

SPECIES ACCOUNT

Black-throated Diver of Old World authors. A small loon with a slender, straight, daggerlike bill. *Nuptial adult*: grayish black head fading to pale gray on nape and hindneck; black chin and throat, the latter crossed by a tiny patch of vertical white streaks; purple-glossed black foreneck; black and white lineations on sides of neck and on sides of white chest; black back with large patch of vertical white bars on each scapular region and a small patch of smaller white bars on each side of upper back; essentially white below. *Winter*

adult: blackish brown above (slightly paler on nape); white cheeks and under parts. Contrast between blackish upper parts and white under parts somewhat greater than in other loons. Length, 24 in.; wingspan, 3¼ ft.; weight, ca. 5 lbs.

RANGE: Practically Holarctic. In New World, Alaska, n.w. Canada, and s. Baffin Island, south to n. Saskatchewan and n. Ontario; in Old World, n. British Isles, Scandinavia, Novaya Zemlya, Russia (south to lat. 55° N.), Siberia, and Sakhalin. Winters chiefly coastally, in New World, from s.w. Alaska to s. Baja California and Sonora; in Old World, from North and Baltic seas to w. Mediterranean, Black and Caspian seas, and from Kamchatka Peninsula to Japan and e. China, also inland on Lake Baikal.

TEXAS: *Winter*: Casual on upper and central coasts and in Trans-Pecos. Several definite sightings and one collection: Harris Co., Houston (2 seen, Dec. 27, 1962, Clinton Snyder, Linda Snyder); Galveston Co., Texas City Dike (3 discovered, Jan. 15, 18, 1969, L. Snyder, and seen several times in Feb. and Mar., 1969, L. Snyder, Margaret Anderson, T. B. Feltner, S. G. Williams, et al.; 1 seen, early Jan–early Apr., 1971, L. Snyder, M. Anderson, Jane Robinson); Aransas Co., Rockport (1 seen, Mar. 30–Apr. 10, 1958, Connie Hagar, B. L. Monroe, Jr., F. M. Weston; 1 adult in summer plumage seen, June 20–22, 1960, C. Hagar); Nueces Co., Padre Island, 17 mi. south of Port Aransas (1 seen, Mar. 29, and Apr. 1, 1958, Monroe, Weston); Reeves Co., Balmorhea Lake (2 seen, Jan. 1, 1969, Roy Brooks, M. E. Isleib, T. S. Jones; 1 specimen collected, 1971, see detailed account); El Paso Co. (Lake Ascarte, 1 seen, Nov. 25–30, and Dec. 5, 1963, Mary Belle Keefer, et al.; El Paso, 1 seen, Jan. 1–2, 1971, Ruby Allen, Elsie Campbell, Ludwig Deppisch, Mrs. J. C. McClintock, Geth White).

HAUNTS AND HABITS: The tundra or forest lakes of the Arctic Loon are often somewhat smaller than those required by the Common but rarely so small and shallow as those that suffice for the Red-throated. Birds often fly to other lakes, rivers, and marine waters to feed. The standard nest site, at water's edge or on an islet, is either a scrape or depression in the ground or an earthen mound covered with decaying vegetation. Freeze-ups in fall prompt *Gavia arctica* southward, and flights to temperate seacoasts are often quite extensive. Some individuals—for example, a nester from Ungava moving coastwise to and from Baja California—would fly approximately 12,000 miles a year. On winter waters, the present species tends to range farther offshore or in larger bays than the Red-throated Loon.

Like the Common Loon, the Arctic cannot take off from land and must run laboriously along the water's surface to get airborne. Once on the wing, it flies swiftly with rapid wing-beats. *Gavia arctica* is a very active diver; a bird observed in Scotland made 201 dives in approximately 3½ hours with only three brief rest stops (W. Earl Godfrey). Normal plunges are to depths of about twenty feet. In addition to fish, the

loon eats varying amounts of crustaceans, mollusks, water boatmen, dragonfly nymphs, other aquatic insects, and seeds and bits of pondweed, bulrushes, and similar plant matter.

The Arctic Loon has many loud growls, croaks, and other strange cries which are reserved mostly for the breeding season. Its common cry, often given in flight, is a guttural *kwuk kwuk kwuk kwuk kwuk*, which is frequently uttered as a single note. A characteristic stress call is a yelp—like a dog being kicked—sounded before the bird dives. A few other vocalizations include a rapid series of ducklike *qua*'s, a ravenlike *kowk*, and a clear *oo-loo-lee*.

DETAILED ACCOUNT: ONE SUBSPECIES

PACIFIC ARCTIC LOON, *Gavia arctica pacifica* (Lawrence)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt from winter plumage. (See Forbush, 1925, *Birds of Mass.*, vol. 1, p. 26; see also species account above.) *Adults, winter:* Acquired by complete postnuptial molt. Upper surface blackish brown; wing-quills brownish black, inner webs paler; tail black, tipped with white; lower parts white, except flanks and lower tail-coverts brown; lining of wings white. *First nuptial:* Acquired by wear from first winter, which it resembles. *First winter:* Acquired by complete molt from juvenal. Throat and foreneck white; crown and hindneck light gray; rest of upper surface dark brown. *Juvenal:* Acquired by complete molt from natal. Pileum and hindneck brown; rest of upper surface dark brown with pale gray feather margins; under parts mostly white but with some dark brown; wings mostly as in adults, the superior coverts with grayish tips.

MEASUREMENTS: *Adults:* Wing, 279.4–311.2 (average, 293.1) mm.; tail, 52.1–61.0 (56.6); bill (exposed culmen), 48.3–59.7 (54.1); height of bill at base, 14.0–16.5 (15.7); tarsus, 63.5–76.2 (66.0).

RANGE: Identical to that of species in New World (with the exception of Cape Prince of Wales, Alaska, where the largely Siberian *G. a. viridigularis* nests).

TEXAS: *Winter:* One specimen, very likely of this race: Reeves Co., Balmorhea Lake (male, Jan. 3, 1971, J. C. Henderson; Texas A&M University collection, no. 8571).

RED-THROATED LOON, *Gavia stellata* (Pontoppidan)

SPECIES ACCOUNT

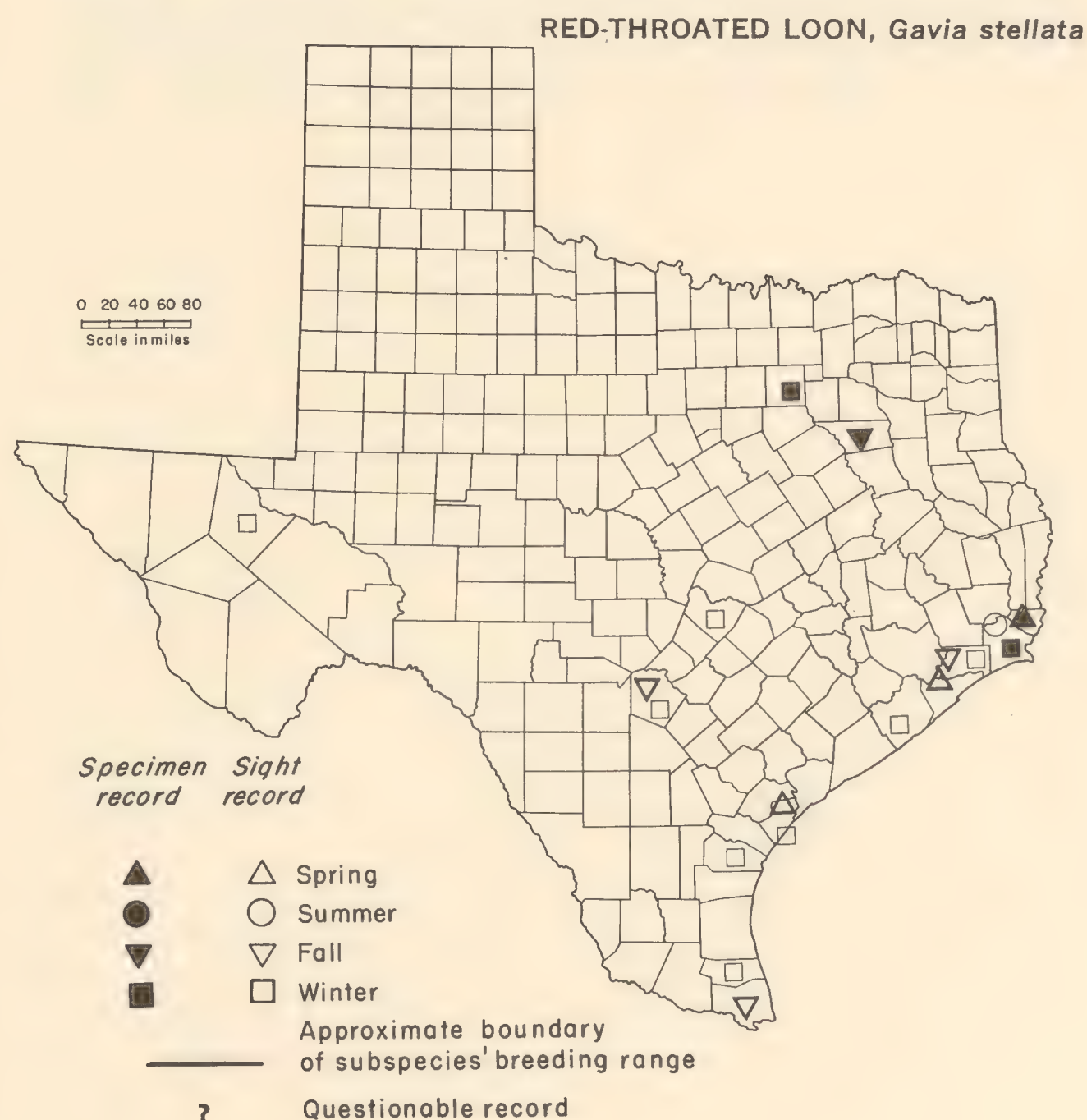
Red-throated Diver of Old World authors. A small loon with long, thin, pointed blue-gray bill that upturns slightly. *Nuptial adult:* gray head and sides of neck; triangular chestnut patch on foreneck; bold black and white lineations on hindneck; mainly dark brown back; white chest and under parts. *Winter adult:* grayish brown above, heavily sprinkled on back with minute white spots ("stars"); white cheeks, throat, foreneck, chest, breast, belly. Length, 25¼ in.; wingspan, 3½ ft.; weight, 3 lbs.

RANGE: Circumpolar in Arctic, in New World south to w. Alaska, w. British Columbia, n. Mackenzie, coast of Hudson Bay, Labrador, and Newfoundland; in Old World south to n. British Isles, Scandinavia, n. Russia, Lake Baikal, Kamchatka Peninsula, and Sakhalin.

Winters chiefly coastally, in New World from Bering Sea to n. Baja California and Sonora, and from Nova Scotia to s. Florida, a few into n. Gulf of Mexico; in Old World from North Sea to west coast of Europe, Black and Caspian seas, and from Japan to e. China.

TEXAS: (See map.) *Winter:* Nov. 2 to June 5. Scarce to rare on upper coast (20 definite records); very rare on central coast (8 records); casual on lower coast (Willacy Co., Port Mansfield, 2 seen, Jan. 6, 1969, Rev. and Mrs. R. C. Smith; Cameron Co., Nov. 29–30, 1957, Clarence Cottam) and on Balmorhea Lake, Reeves Co. (1 seen, Jan. 1, 1969, Ruth Isleib; Anne LeSassier; 2 seen on Audubon Christmas Bird Count, Dec. 19, 1971, Frances Williams, compiler). Scattered inland records outside Trans-Pecos: Dallas Co. (see detailed account); Henderson Co. (see detailed account); Travis Co., Colorado River in Zilker Park, Austin (1 seen, Dec. 2–20, 1964, Jo Alys Downs, E. B. Kincaid, Jr., F. S. Webster, Jr., et al.); San Antonio (1 seen, Nov. 2, 1961, C. R. Bender, Mr. and Mrs. G. B. Harding).

HAUNTS AND HABITS: The handsome Red-throated Loon breeds on lakes and pools, often quite shallow and small, in open tundra as well as in forests. From these places it flies to larger, deeper lakes, estuaries, and sea-coasts to feed. Its nest varies from a mere depression in the ground to a platform of moss and other vegetation; the loons add plant matter throughout incubation—often until the nest reaches considerable bulk. Initially the site is usually on bare ground near water's edge, but before eggs hatch, a tall heavy growth of vegetation has often grown up. Though ordinarily a one-pair nester, occasionally two pairs or a small colony share a pond; in some places, nesting Northern Phalarope, Mallard, Oldsquaw, King Eider, and Herring Gull have been tolerated. *Gavia stellata* winters almost exclusively on temperate, sometimes subtropi-



cal, seacoasts; migrations are mainly via seacoasts also. During the nonbreeding season, the species is somewhat gregarious.

Flight, with rapidly beating wings, is swift and strong; this species raises its wings higher than do its relatives. More adept at taking off than the heavier loons, the Redthroat requires considerably less water surface for a runway and sometimes leaps almost directly into the air; it is said to be the only loon which can take flight from land. When alighting on water, it skids along the surface, at times with wings lifted, for a considerable distance. In search of small fish, it dives usually to depths of about thirty feet, though undoubtedly deeper on occasion, and stays submerged up to ninety seconds. To its mainly fish diet it adds a few fish spawn, frogs, leeches, aquatic insects, shrimps, marine worms, and snails. Movement on land, though tedious, is a bit less awkward than that of other gaviids.

The Red-throated Loon has a rather extensive vocabulary. A rapid guttural series of Arctic Loon-like *kwuk kwuk kwuk*'s, sounding at times like *karkarack*, is given usually on the wing. A single *kwuk* or *kark* serves as an alarm. Individuals also sound a drawn-out mewing shriek; a weird far-reaching growl, described as *gayorworrk*; a low hoarse cough; and, apparently when young are in danger, an angry *crok* or *aarh*. Vocalizing is done, for the most part, during the breeding season, by day or by night. Springtime migrants in flight quack rather like barnyard ducks.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Head and sides of neck mouse gray, pileum spotted with black; foreneck with triangular (apex pointing up) patch of chestnut; hindneck heavily streaked with black and white; upper parts and wings chaetura drab, slightly glossed with olive green, and occasionally with a few small white spots on wing-coverts; sides chaetura drab,

streaked or spotted with white; jugulum, breast, and abdomen white, and sides of jugulum with broad chaetura drab streaks; crissum chaetura drab, edged and somewhat mixed with white. Bill deep black with yellowish tip, or dull blue-gray, with grayish white stripe on culmen, and base of mandible purplish gray; iris carmine or light brick red; outside of legs and toes bluish white; inside of tarsus, joints of toes, and whole of outer toe black or dark gray. *Adults, winter:* Acquired by complete post-nuptial molt. Head and hindneck dark mouse gray with some minute pale gray and white edgings, remainder of upper parts and wings chaetura black with numerous roundish or oblong white spots; these least conspicuous or absent on rump; lower parts white; throat nearly immaculate or with very fine spots or mottlings of light hair brown or drab, an indistinct band across anterior part of crissum and shaft markings on lower tail-coverts of same color. Bill light brown or gray. *First nuptial:* Acquired by partial prenuptial molt from first winter. Much like nuptial adults, but duller; reddish area on foreneck smaller and more yellowish; back similar to that of first winter, but with fewer whitish markings. Bill olivaceous black, but pale drab gray on base of mandible; gape puritan gray; iris carmine or coral red; legs and feet externally brownish black, internally, with webs of toes, bluish white to pale russian blue. *First winter:* Acquired by wear from juvenal, with which it is identical. *Juvenal:* Similar to adults in winter but rather paler; head dull neutral gray; upper parts fuscous with numerous spots and V-shaped markings of white; throat mottled with grayish or hair brown. Bill bluish black, darker on culmen, or pale medici blue, but culmen natal brown and tip of bill white; iris sudan brown; legs and lower part of toes black; upper part of toes, with webs between toes, pale russian blue.

MEASUREMENTS: *Adult male:* Wing, 260.1–291.1 (average, 277.1) mm.; tail, 44.4–56.4 (50.8); bill (exposed culmen), 47.0–54.6 (51.3); height of bill at base, 13.0–15.0 (14.2); tarsus, 68.1–79.5 (73.7); middle toe without claw, 69.6–81.5 (74.7). *Adult female:* Wing, 250.0–287.0 (268.7); tail, 42.4–51.6 (47.8); bill, 46.0–58.9 (49.8); height of bill, 12.4–14.0 (13.2); tarsus, 65.0–73.9 (69.1); middle toe, 67.1–79.5 (71.4).

TEXAS: *Winter:* Four specimens: Dallas Co., Trinity River valley (Dec. 12, 1937, W. A. Mayer); Henderson Co., Koon Creek Klub (male, Nov. 28, 1948, Ted Dealey; Dallas Museum of Natural History, no. 3911); Orange Co. (adult male, Mar. 1, 1889, F. B. Armstrong); Jefferson Co., Sabine Pass (Nov. 27, 1936, Bessie Reid). Birds shot by hunters in Jefferson Co.: ca. 1915, ca. 1917, ca. 1932, winter of 1935, ca. 1935, and Jan. 17, 1936.

Grebes: Colymbidae

RED-NECKED GREBE, *Pedetaithya grisegena* (Boddaert)

SPECIES ACCOUNT

Podiceps grisegena of A.O.U. check-list, 1957 (see Appendix A). North American bird also called Holboell's Grebe. A large grebe with a long, stout neck; has straight pointed yellowish bill; in flight shows conspicuous white patch confined to secondaries (instead of wing-stripe extending onto primaries as in Western Grebe). *Nuptial adult*: black crown (slightly crested on hind part) and back; white, washed with pale gray, on chin, throat, and sides of head; cinnamon neck, chest; white below. *Winter adult*: grayish black above (darkest on crown); grayish stroke behind eye; whitish on throat, extending to form crescentic patch on side of head; brownish gray neck, chest. Length, 20¼ in.; wingspan, 32½; weight, 2 lbs.

RANGE: Holarctic. In New World, from Alaska and w. Canada, south to extreme n. United States; in Old World, locally from Denmark, Sweden, Finland, n. Russia, and e. Siberia, south to e. Europe, Caspian and Aral seas, and extreme n. Manchuria. Winters on sea-coasts, in New World, from Alaska to s. California, and from Nova Scotia to c. Florida, a very few into n. Gulf of Mexico; in Old World, from North Sea to w. Mediterranean, Black and Caspian seas, and from Japan to e. China.

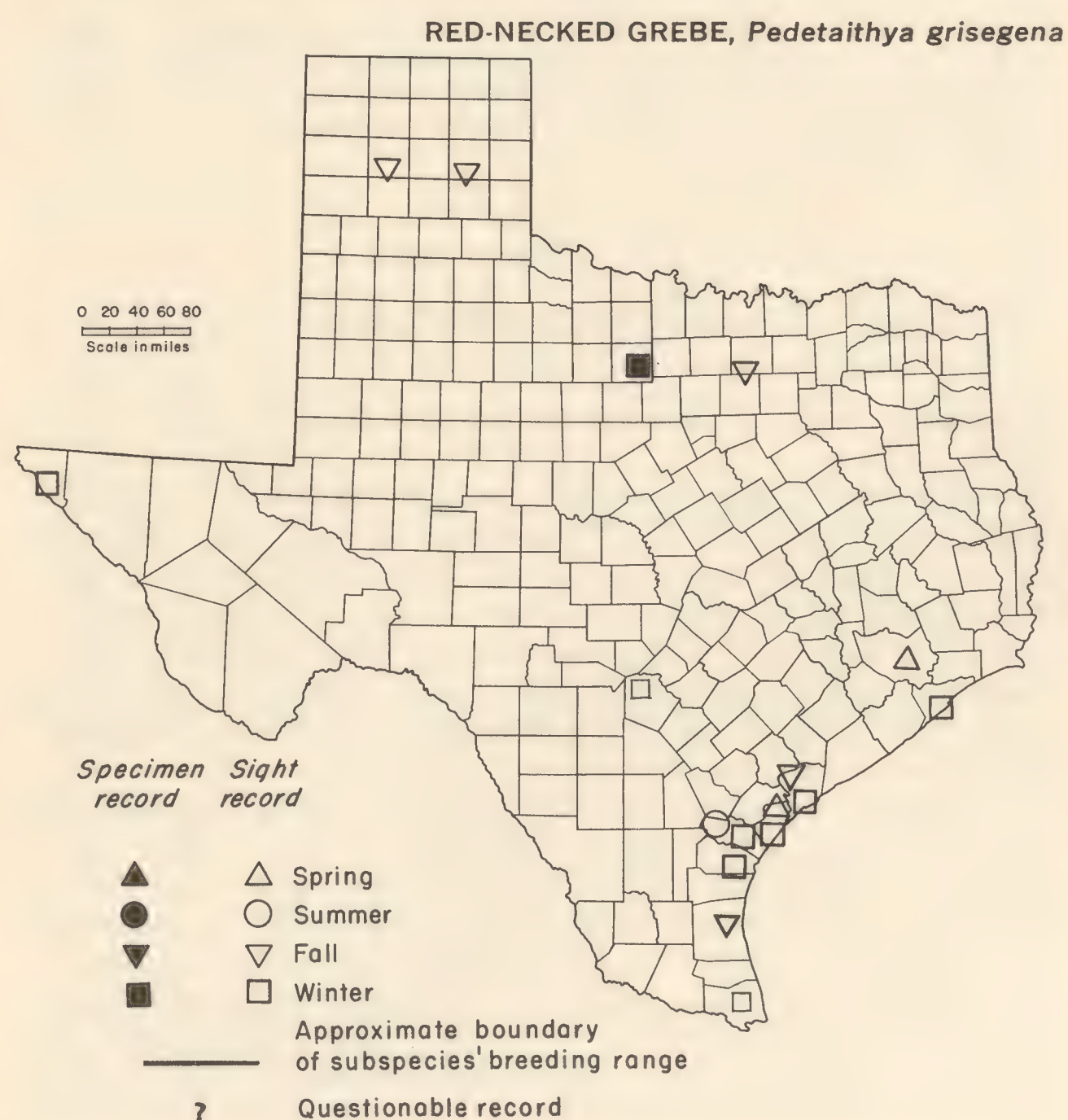
TEXAS: (See map.) *Winter*: Sept. 1 to Mar. 24—once on June 3. Rare and irregular on central coast (only 12 definite sightings). Casual on upper coast (Galveston, 1 seen, Feb. 28, 1954, M. A. Yramategui; Harris Co., Bayshore, 1 seen, Mar. 5, 1963, Linda Snyder; Texas City Dike, 1 seen, Dec. 16, 1972, J. A. Tucker, R. H. Wauer), on lower coast (Cameron Co., Laguna Atascosa Nat. Wildlife Refuge, Dec. 15, 1967, fide R. J. Hitch; Kenedy Co., Armstrong, 1 seen, Nov. 14, 1971, Mr. and Mrs. J. C. Arvin), in Panhandle (Gray Co., Lake McLennan, Sept. 26, 1954, H. F. Saunders; Potter Co., Amarillo, 1 seen, Oct. 31–Nov. 7, 1954, Peggy Acord, et al., and another individual, Mar. 2, 1971, Acord, Ken Seyffert), and in north central Texas (Young Co., 1 specimen, see detailed account; Denton Co., Denton, 1 seen, Oct. 11, 1952, M. K. Rylander). Accidental in Trans-Pecos (El Paso, 1 seen, Feb. 2, 1936, Mary Belle Keefer, Lena McBee), and in south

Texas (Bexar Co., Mitchell Lake, 1 seen, Feb. 6, 1928, H. C. Oberholser).

HAUNTS AND HABITS: Grebes are expert surface divers; they never dive from the air. These birds swim both on and under water with their oar-toed feet, which they also use in spectacular nuptial season races, when running over water to gain flight speed, and for steering their virtually tailless bodies once they are in the air. Members of this family are practically helpless on land—a grebe's legs are placed so far back on its body that it does not stand upright or walk on land except in extreme emergencies.

Of the world's twenty species of grebes, six are found in North America. At one time or another, all six have occurred in Texas, although only three are to be expected regularly. The Red-necked Grebe is one of the unpredictables.

This large grebe (in North America only the Western is larger) nests in lake-dotted terrain of the Northern Hemisphere, from prairies to boreal woodlands, taiga, and tundra. It is a solitary nester; one pair usually defends 75 to 125 yards of shoreline on a small



(though in excess of 10 acres), quiet lake or pond with lush emergent vegetation. The floating nest of decaying vegetation, incomplete when the female begins egg laying, is anchored on the edge of or within cattails (*Typha*), sedges, bulrushes (*Scirpus*), or similar plants. In North America during July and August, there is a postbreeding dispersal mainly along migration routes but also with considerable scattering in the northeastern and Atlantic states. Groups, up to one hundred or so individuals, gather in spring and fall prior to migration. On winter waters, usually along sea-coasts, *P. grisegena* tends to range seaward of breakers—sometimes miles from shore—or in large bays.

When migrating, the present species exhibits rather strong, direct flight. At other times, especially when frightened, grebes are reluctant to take wing and would rather quietly sink or quickly dive. The Red-necked Grebe stays under about a minute on the average; it controls its buoyancy by compressing or expanding its plumage, lungs, and air sacs in the body. Near or at the bottom, it forages for small fish but is not overly dependent on them. Often dwelling on fishless ponds, it eats what is available: crayfish, dragonflies and nymphs, water striders, flies, wasps, ants, bees, and other aquatic or land insects, tadpoles, and salamanders; in marine situations, mud lobsters, shrimp, prawn, marine worms. Grebes have the apparently unique habit of regularly eating feathers; at times, they even feed them to their young. Mats of feathers in the stomach may detain sharp fish bones until digestive juices have softened them, thus preventing injury to the intestines. Perhaps, also, grebes eat their feathers because they crave the waterproofing fatty oil present on them.

At any season, though much less frequently in fall and winter, the Red-necked Grebe sounds a *crik crik* or *teck teck* note. On the breeding grounds, usually until mid-summer, male and female, often in duet, utter nasal donkeylike braying (rendered as *konk*) which terminates as a whinny.

DETAILED ACCOUNT: ONE SUBSPECIES

HOLBOELL'S RED-NECKED GREBE, *Pedetaithya grisegena major* (Temminck and Schlegel)

Podiceps grisegena holbollii of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Upper parts fuscous black, but hindneck somewhat mixed with cinnamon rufous and back slightly edged with pale brown; wing-quills rather lighter than upper surface, and inner secondaries mostly white, forming conspicuous white patch on wing; anterior inner lesser wing-coverts also white; chin dull white; upper throat and sides of head smoke gray or drab gray; rest of throat and jugulum cinnamon rufous; remainder of lower parts white, but more or less mottled by hair brown centers of feathers, sides darker—between hair brown and drab—and with somewhat buffy suffusion. Bill above brownish black, cutting edges at base and most of mandible olive yellow or bright yellow; iris mummy brown, hair brown, or carmine, narrowly encircled by straw yellow or lemon yellow; eyelid yellow; legs and toes greenish black on outer side, yellow on inner side; edges of lobes of toes tinged with brown; claws slate black. *Adults, winter:* Acquired by com-

plete postnuptial molt. Head and hindneck fuscous, remainder of upper parts fuscous black, and mantle with conspicuous whitish or pale greenish edgings; sides of head pale hair brown, more or less mixed with whitish; throat white; jugulum drab or light hair brown, remainder of lower parts pure white with some lateral hair brown mottlings, which occupy most of sides of body. Bill mostly yellow with darker culmen. *First nuptial:* Acquired by prenuptial molt from first winter. Resembling nuptial adult but duller; chin and throat more whitish; pileum more brownish; cheeks mottled and not sharply defined from crown; color pattern of head not so well defined. *First winter:* Acquired by molt from juvenal. Similar to adult in winter, but with cinnamon rufous on foreneck; crown lighter; no sharp line of demarcation between throat and neck. Basal part or all of culmen black or seal brown; rest of bill ocher yellow; iris primrose yellow; outer side of tarsus and of lobes of toes brownish black or seal brown, inner side maize yellow or bright greenish yellow; claws yellowish olive buff. *Juvenal:* Acquired by complete post-natal molt. Similar to adult in winter, but crown lighter; two or three broad white stripes on side of head; gray of throat and cheeks not sharply defined against color of neck; foreneck with some cinnamon rufous. Bill olive yellow, but basal part of maxilla seal brown; iris dark brown, brownish yellow, or maize yellow, with broader yellow ring; outside of legs and feet dull black, inner side bright greenish yellow or chrome yellow; claws slate.

MEASUREMENTS: *Adult male:* Wing, 183.1–199.9 (average, 190.0) mm.; tail, 31.0–40.4 (33.8); bill (exposed culmen), 46.0–50.5 (48.3); height of bill at base, 13.0–16.5 (14.7); tarsus, 58.4–66.0 (63.2); middle toe without claw, 57.4–66.0 (62.7). *Adult female:* Wing, 184.9–199.9 (191.3); tail, 26.9–42.9 (35.8); bill, 47.5–56.4 (50.3); height of bill, 14.0–15.5 (14.7); tarsus, 60.5–67.6 (63.8); middle toe, 57.9–68.1 (63.2).

RANGE: N.e. Siberia (excluding Kamchatka Peninsula), south to Kurile Islands and n. Japan (Hokkaido), thence in North America, from n. Alaska and s.w. Mackenzie to s.w. Ontario, south to n. Washington and s.w. Minnesota, sporadically to New Hampshire. Winters coastally in w. and e. Pacific and w. Atlantic, south to approximately lat. 25° N.; in North America, from Aleutian Islands (casually) to s. California, and from Nova Scotia to c. Florida, a very few into n. Gulf of Mexico.

TEXAS: *Winter:* One specimen (preserved?): Young Co., near Eliasville (1 taken between 1884 and 1890, H. Y. Benedict).

HORNED GREBE, *Dytes auritus* (Linnaeus)

SPECIES ACCOUNT

Podiceps auritus of A.O.U. check-list, 1957 (see Appendix A). Slavonian Grebe of Old World authors. A rather small grebe with thin pointed blackish bill (straight and shorter than head). *Nuptial adult:* black crown and distensible cheek-ruffs; long, pale golden tufts extending back from each eye to form lateral crests (“horns”); black back; russet foreneck, chest, sides; white belly. *Winter adult:* lacks “horns”; cheek-ruffs much reduced; has blackish crown, hindneck, and back; white cheeks (these almost meet on back of head), foreneck, and chest. In this plumage, similar to winter Eared Grebe, but bill straight (not upturned); sides of head, throat, and foreneck clear white (not smudged). Length, 13½ in.; wingspan, 23¼; weight, 1 lb.

RANGE: N.w. North America, south to Oregon and Minnesota; in Old World, Iceland, Faeroes, and British Isles to Scandinavia and about lat. 65° N. in Russia and Siberia, south to Altai Mts., Lake Baikal, and n.

Manchuria. Winters chiefly coastally, in North America, south to California, Texas, and Florida; in Old World, in North Sea, w. Mediterranean, Black and Caspian seas, and coasts of Japan, Korea, and e. China.

TEXAS: (See map.) *Winter*: Oct. 1 to May 3. Scarce to rare virtually throughout; however, occasionally uncommon on upper and central coasts. May occur in fair-sized flocks some winters: Henderson Co., Trinidad (26 seen, Dec. 23, 1967, fide Gerald Smith); Travis Co., Lake Austin (10 seen, Oct. 14, 1956, F. S. Webster, Jr.); Harris Co., San Jacinto Bay (up to 50 seen, winter 1966-67, Linda Snyder); Cameron Co., Laguna Atascosa Nat. Wildlife Refuge (35 seen, Nov. 17, 1959, L. A. Stemmerman).

HAUNTS AND HABITS: The Horned Grebe takes up breeding in the northern portions of the Eared Grebe's range and nests northward well into the boreal zone. Nesting waters for the present species are quiet small ponds and marshes with some open water; vegetation varies from largely submerged—thus affording scant cover—to densely emergent. The floating nest, in general like those of other grebes, is usually anchored to, and more or less concealed by, shoreline growth. Unlike the Redneck, the Horned exhibits practically no postnuptial dispersal. Usually singly, migrants pass overland by night; along coasts they also fly by day. Practically any body of water is suitable for transients. The species is basically nongregarious, but individuals gather at staging points prior to migration, at regular rest stops along the way, and in sheltered feeding areas.

The Horned is more frequently seen on the wing than other U.S. grebes; it can lift off and alight on relatively small spaces of water. In waters from five to twenty-five feet deep, it forages for insects and fish; various crustaceans and an occasional frog, salaman-

der, leech, or tadpole are also consumed. Feathers have comprised up to 55 percent of some Horned Grebe stomach contents.

Individuals converse with low-toned *cr-r-r-r-r*'s and sharp *yeark yeark*'s, though exchanges are much less frequent in fall and winter. Horned Grebe nuptial vocalizations include various mews, gurgles, croaks, and shrieks, heard singly or in series.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN HORNED GREBE, *Dytes auritus cornutus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by prenuptial molt from winter plumage. Upper parts chaetura black; forehead chaetura drab; hindneck glossy greenish black; mantle conspicuously edged with pale gray, greater portion of middle secondaries pure white; chin and throat fuscous black; jugulum, upper breast, lores, and sides russet; broad postocular stripe ochraceous buff, joined behind with its fellow, thus completely encircling crown; remainder of lower parts white, russet sides somewhat mixed with light hair brown. Bill bluish black, but tip yellow or dull white; line of bare skin from eye to rictus vermilion or carmine; iris bright carmine or poppy red, with narrow inner white ring, or sometimes with irregular yellow ring; feet externally fuscous or black, on inner side dull yellow or french gray and white; claws plumbeous or fuscous. *Adults, winter*: Acquired by complete postnuptial molt. Upper parts chaetura drab or deep mouse gray; mantle somewhat edged with paler; hindneck lighter; lower parts white, somewhat mixed with mouse gray on jugulum. Bill bluish gray or bluish slate, lighter beneath; bare loreal space bluish gray; iris bright carmine, with inner white edge; legs and feet bluish gray. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter but with lighter edgings on upper parts; crown more brownish and lighter; inferior parts less clearly white. Bill usually paler. *Juvenal*: Acquired by complete postnatal molt. Similar to first winter, but sides of head and throat with dull dark brown stripes and spots. Maxilla slate black, but tip and base dull white or pale vinaceous buff; mandible olive gray or pale vinaceous buff, but at base dull white; iris drab gray, pale drab, or seal brown.

MEASUREMENTS: *Adult male*: Wing, 136.4-146.6 (average, 143.0) mm.; tail, 33.0-46.0 (39.6); bill (exposed culmen), 22.1-26.9 (24.1); height of bill at base, 8.1-9.4 (8.6); tarsus, 46.0-48.5 (47.3); middle toe without claw, 43.4-48.0 (45.2). *Adult female*: Wing, 134.1-140.0 (136.1); tail, 30.5-39.9 (35.6); bill, 20.1-23.1 (22.4); height of bill, 7.6-8.6 (8.4); tarsus, 44.4-48.0 (45.7); middle toe, 41.9-46.0 (43.7).

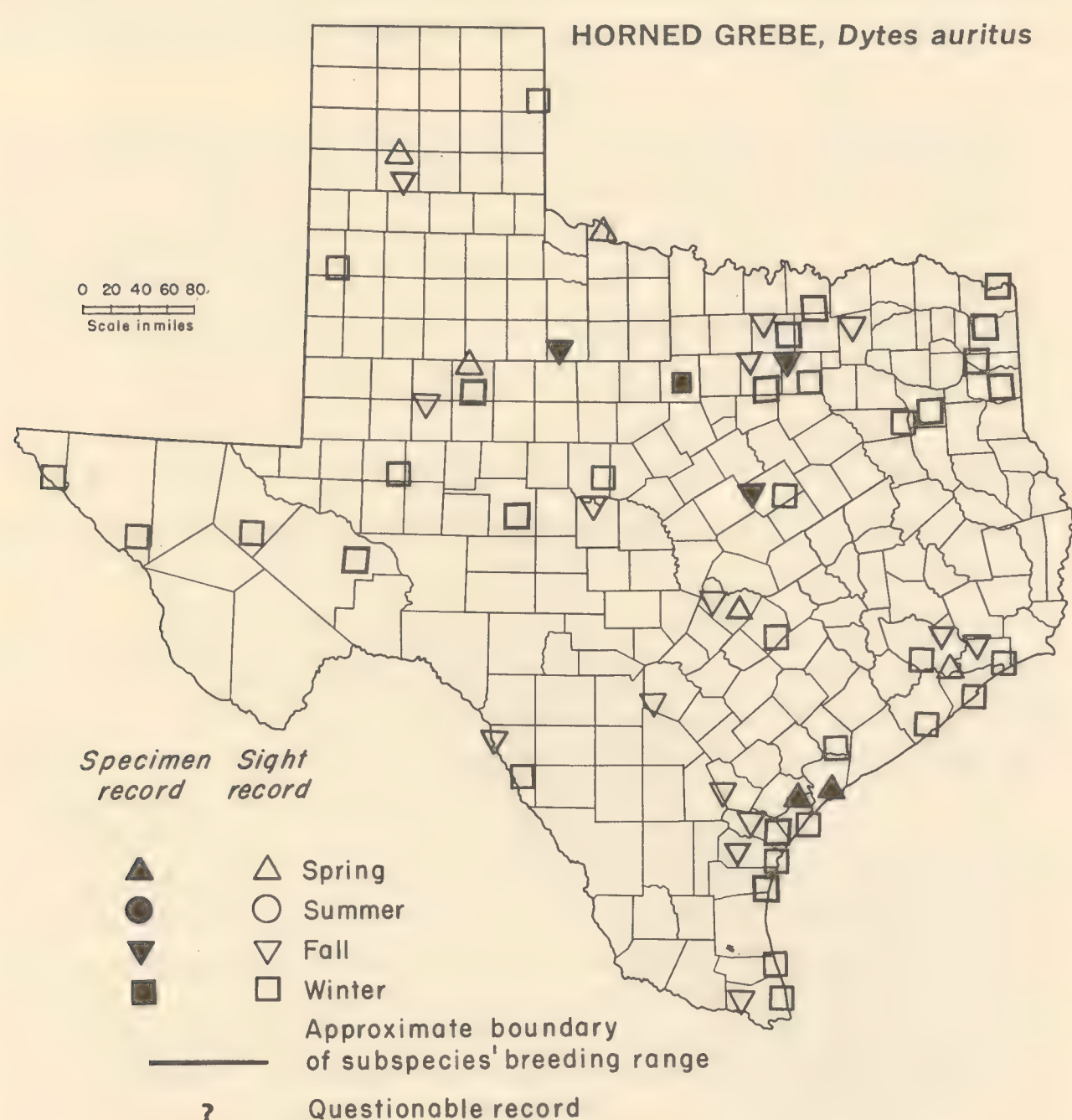
RANGE: W. Alaska and n.w. Mackenzie to n.w. Ontario, south to n.e. Washington and n.e. Minnesota; formerly bred regularly, now casually, south to n. Utah, n. Indiana, and Maine. Winters chiefly coastally, from Aleutian Islands to s. California, and from s. Nova Scotia to Florida and Texas.

TEXAS: *Winter*: Taken in Haskell (Oct. 29), Palo Pinto, Dallas (Oct. 20), McLennan (Oct. 20), Calhoun (Apr. 8), and Aransas (Mar. 23) cos.

EARED GREBE, *Proctopus caspicus* (Hablizl)

SPECIES ACCOUNT

Podiceps caspicus of A.O.U. check-list, 1957 (see Appendix A). Black-necked Grebe, *Podiceps nigricollis*, of many Old World authors. A small, slim-necked grebe with thin pointed black bill (slightly upturned and shorter than head); red eyes. *Nuptial adult*: sharply peaked black crest on crown; golden tufts of feathers



behind each eye that fan onto side of upper neck ("ears"); black neck, chest, back; dark russet sides; whitish below. *Winter adult*: lacks crest and tufts behind eye; mainly grayish black above (darkest on crown) fading to grayish white on sides of head, throat, foreneck, and under parts. Told in this season from the similar Horned Grebe by slightly upturned bill; thinner neck; and less contrasty areas on head—side of head has two more or less separated, smudgy white spots, instead of one clear-cut large white patch. Length, 12¼ in.; wingspan, 21¾; weight (female), 10 oz.

RANGE: S.W. and c. southern Canada, south to n. Baja California and w. and c. United States, also resident in e. Andes of Colombia (form here may be separate species); in Old World, locally from British Isles, n. Europe, c. Russia, e. Mongolia, and Manchuria, south to s. Spain, Italy, Balkan states, Turkey, e. Iran, and Afghanistan, also resident in e. and s. Africa. In New World, winters along Pacific coast from s. British Columbia to Guatemala, and in the interior from Great Basin states to Texas, thence through Mexico to Guatemala; in Old World, from British Isles and Europe to Mediterranean region, Suez Canal, Iran, n. India, Japan, and e. China.

TEXAS: (See map.) *Breeding*: Four recorded localities: Wise Co., Herman Station (nests with eggs found, June 5, 15, 19, and July 2, 1889, J. A. Donald, R. L. More); Bexar Co., Mitchell Lake (eggs collected, June 11, 25, and July 2, 9, 1916, R. W. Quillin; 6 seen and breeding suspected, July 11, 1920, Quillin); Harris Co., Navigation District (nest with 3 eggs found, summer 1962, T. B. Feltner); Bee Co., Beeville (3 very young birds examined in the hand, Aug. 19, 1968, Velma Geiselbrecht). Additional summer records (no indication of breeding): Dallas Co. (1 summered, 1965, W. M.

Pulich); Midland Co. (1 summered, 1955, Frances Williams); Travis Co. (1-2 summered, 1961, G. F. Oatman, Jr., et al.; 1-5 individuals, June-July, 1962, F. S. Webster, Jr.); Bexar Co., Bluewing Lake (2 seen, June 19, 1926, R. W. Quillin); Galveston Co. (present, June, 1957, V. L. Emanuel). *Winter*: Mid-Sept. to mid-May (extremes: Aug. 30, June 5). Locally very common to fairly common along coast from Chambers Co. to Brownsville; irregularly common to scarce in interior north to middle Panhandle and east to about 96th meridian; rare inland east of 96th meridian (recorded, Henderson, Smith, and Harrison cos.). Usually absent in mid-winter from northern Panhandle, where locally fairly common to rare as migrant (data insufficient to establish migration dates).

HAUNTS AND HABITS: Disjunct nesting populations of the Eared Grebe are found in many different climates, although rarely in deserts and never in tundra or tropical rain forests. In western North America, typical habitat is a shallow marshy section of a medium to large lake where emergent plants, frequently tules, leave only small patches of water. Migrants and winter birds seek large open waters—fresh lakes, brackish estuaries, and salt bays. Winter birds that occur along coasts are rarely seen far from shore. The species, gregarious at all seasons, nests in colonies (but occasionally in single pairs), gathers in groups at migration staging and stop-over points, and swims in more or less loose flocks on winter waters.

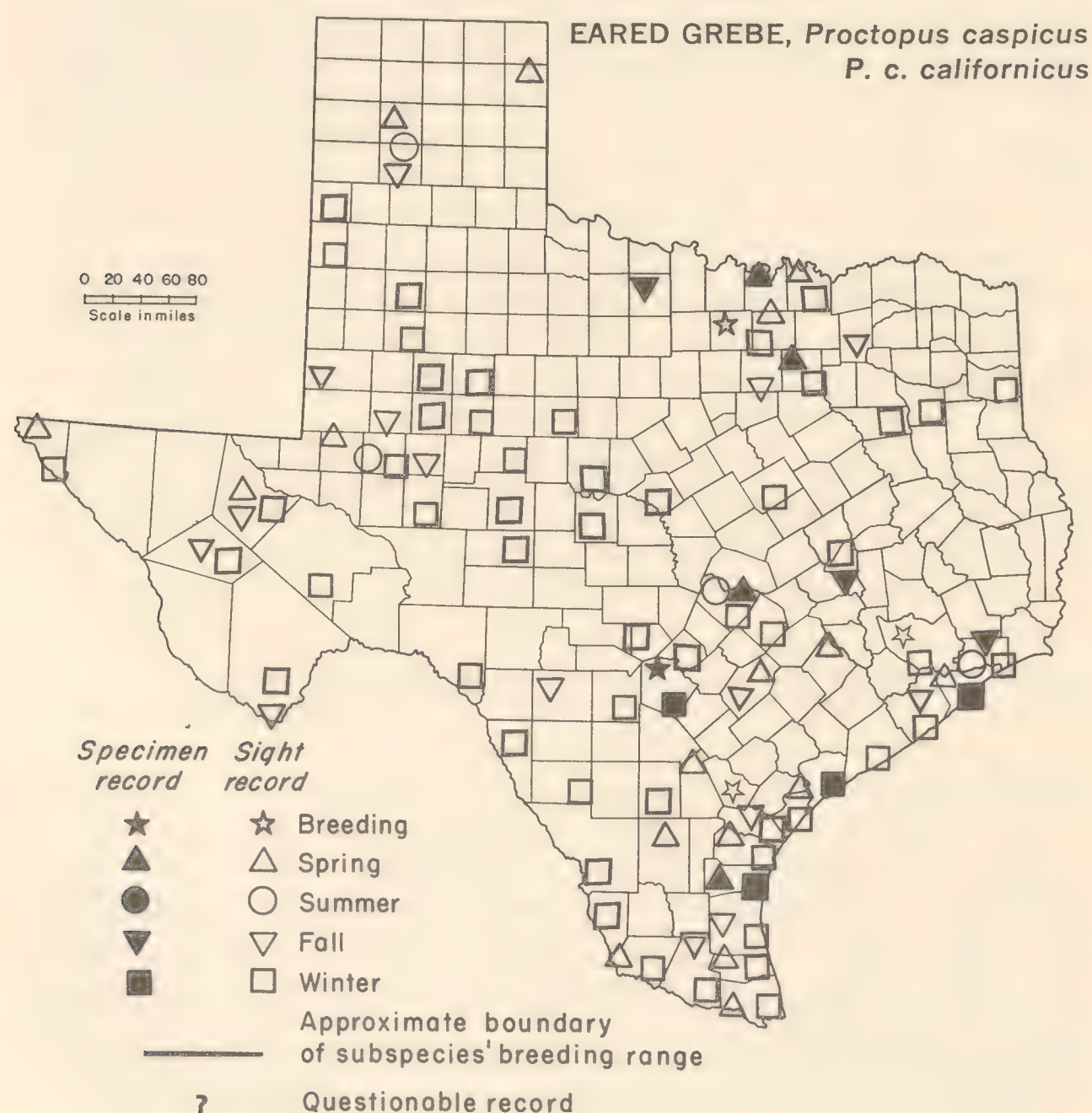
Except during the largely nocturnal migrations, *Proctopus caspicus* rarely flies. When alarmed, it sinks or dives in characteristic grebe fashion. It usually emerges not very far from the sinking point and, in this respect, is more bold than some of the skulkier grebes. Aquatic and land insects—damselflies, dragonflies, grasshoppers, bugs, moths, butterflies, beetles, flies, others—are the Eared Grebe's mainstay; small shrimplike crustaceans are rather important in marine situations. Fish is a relatively minor item.

A squeaky, high-pitched *poo-eep* is the common call of the Eared Grebe, but this is seldom heard in fall or winter. A crooning *wa-waah-wa wa-waaah-wa wa-waaah* is sounded in the nesting colony along with various wheezes, whistles, and tremolos which apparently are significant in nuptial activities.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN EARED GREBE, *Proctopus caspicus californicus* (Heermann)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Upper parts chaetura black, forehead chaetura drab; wing-quills fuscous to hair brown, shafts darker; middle secondaries mostly white, forming conspicuous white patch; chin and throat fuscous black; breast dull black, posteriorly a little mixed with white and dull brown; broad postocular stripe of decomposed plumes extending to sides of neck warm buff; sides and flanks chaetura black, paling to hair brown or drab along abdomen, and extensively mixed with russet; crissum drab or hair brown, a little mixed with russet; lining of wing white. Bill and bare space to eye black; iris bright carmine, scarlet, or vermilion, with inner dull white ring; eye-ring vermilion; legs and feet plumbeous or dull lilac gray externally, dull black or



greenish gray on inner surface. *Adults, winter*: Acquired by complete postnuptial molt. Upper parts chaetura drab or deep mouse gray, feathers of mantle edged with paler gray; sides of head and lower parts white, this extending in irregular collar nearly around neck; jugulum and sides mottled with chaetura drab or gray. Bill above greenish black, paler and more greenish on basal portion, mandible olivaceous, paler below and more yellowish basally; iris bright orange-red, with very narrow white ring next to pupil; tarsus and toes dull black on outer side, with olive green edges, inner side yellowish green, inner toe apple green. *First nuptial*: Acquired by partial prenuptial molt from first winter. Very similar to nuptial adults but somewhat duller. *First winter*: Acquired by wear from juvenal. Practically same as juvenal. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but back more brownish and colors of head duller. Bill smaller and of less characteristic shape, pale buffy pink, tipped with cinereous and with black bar on maxilla, but most of mandible cinereous; legs dark drab; feet brownish olive. *Natal*: Glossy black above, irregularly striped and spotted with whitish or buff; middle of lower parts and cheeks laterally white and posteriorly more or less tinged or washed with chaetura drab, throat often tinged with pinkish buff. Bill dull ocher, banded with black and bluish gray, tip white; iris dark brown; feet greenish at base, reddish or yellowish on edges of lobes of toes.

MEASUREMENTS: *Adult male*: Wing, 125.0–135.9 (average, 128.8) mm.; tail, 32.0–39.1 (36.1); bill (exposed culmen), 23.1–26.4 (24.6); height of bill at base, 7.1–8.9 (7.9); tarsus, 39.9–46.0 (43.7); middle toe without claw, 39.1–46.0 (42.9). *Adult female*: Wing, 119.9–129.5 (124.0); tail, 27.9–35.6 (32.3); bill, 21.1–23.9 (22.9); height of bill, 7.1–7.6 (7.4); tarsus, 39.9–42.9 (41.7); middle toe, 39.1–45.5 (41.7).

RANGE: C. British Columbia and s. Manitoba to e. Minnesota, south to n. Baja California, c. Arizona, and c. Texas (rarely). Winters coastally from s. British Columbia, inland from n. Nevada, s. Utah, and Texas, through Mexico to Guatemala.

TEXAS: *Breeding*: See species account. *Winter*: Taken north to Archer (Nov. 29), east to Chambers (Nov. 11), south to Calhoun and Kleberg, west to Bexar cos.

NESTING: *Nest*: Frequently in colonies, in grassy sloughs, ponds, or lakes, sometimes in open water, often among vegetation; largely submerged floating raft of leaves, rushes, reeds, moss, and other debris; lined with similar vegetation. *Eggs*: 2–10, usually 4–5; ovate to elongate ovate, sometimes almost fusiform; bluish or greenish white; unmarked; sometimes chalky and discolored; average size, 43.4 × 29.9 mm.

LEAST GREBE, *Limnodytes dominicus* (Linnaeus)

SPECIES ACCOUNT

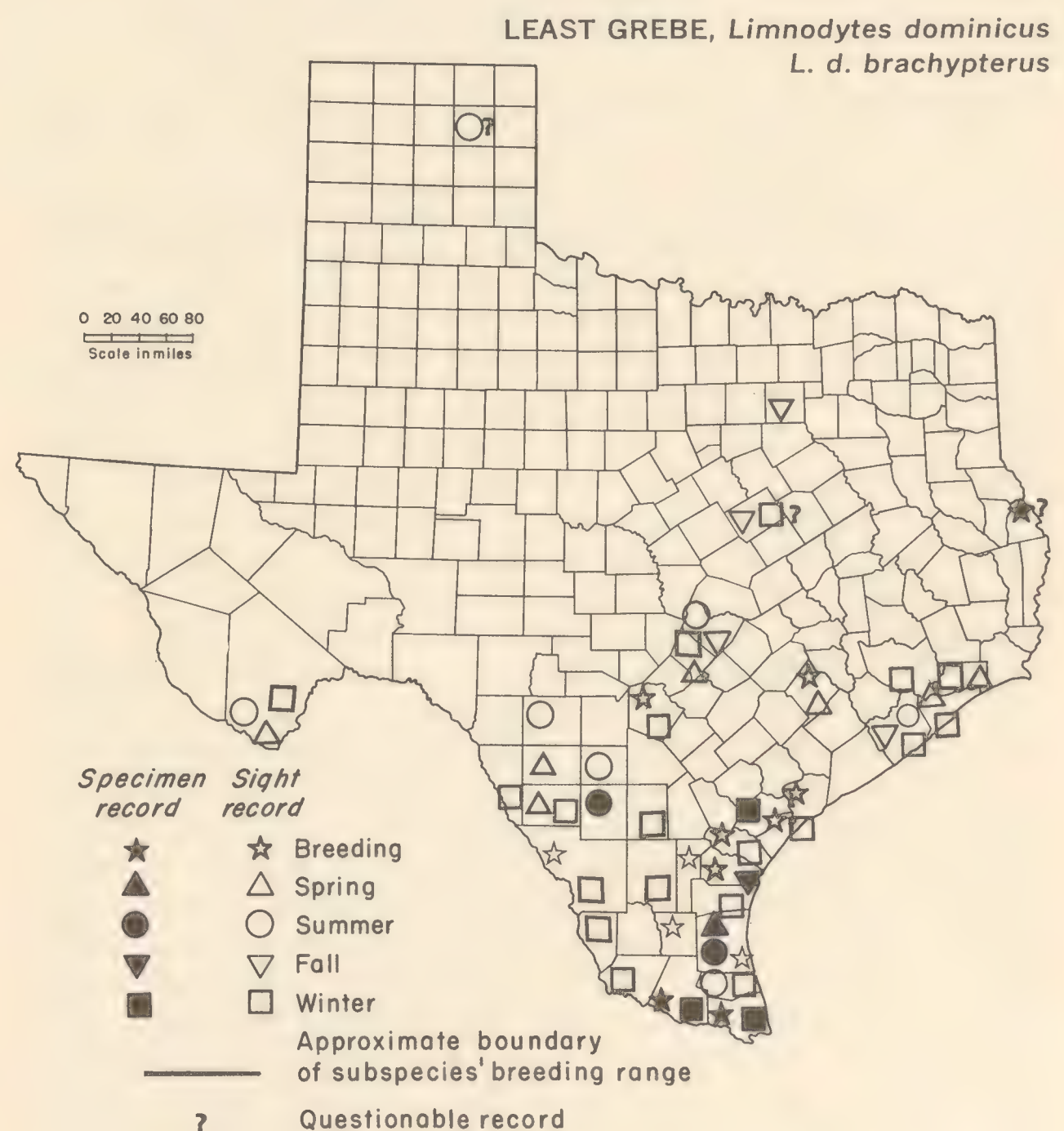
Podiceps dominicus of A.O.U. check-list, 1957 (see Appendix A). Also known as San Domingo Grebe and Mexican Grebe. A tiny, short-necked grebe with a short, thin, pointed black bill; golden eyes; male has thicker head and neck. *Nuptial adult*: black crown and chin; dark gray head and neck; otherwise mainly brownish black (whitish of lower breast and belly seldom seen); in flight, shows large white patch on most of flight feathers. *Winter adult*: lacks distinctly black crown; acquires white chin and throat. Length, 9¾ in.; wingspan, 14; weight, ca. 4–5 oz.

RANGE: S. Texas and s. Baja California, occasionally s.e. California (has bred) and s. Arizona (stragglers), south through lowlands of mainland Mexico, Central America, and South America to c. Argentina; also Bahamas, Greater Antilles, Trinidad, and Tobago.

TEXAS: (See map.) *Resident*: Breeds, mid-Feb. to

late Sept.—occasionally to mid-Dec. (eggs, Mar. 3 to Sept. 6; young of all ages, Apr. 1 to Dec. 19) from near sea level to about 700 ft. Locally common to uncommon near central and lower coasts (Calhoun Co. to San Patricio, Brooks, Kenedy, Hidalgo, and Cameron cos.); uncommon to scarce over remainder of south Texas brush country north to Uvalde and San Antonio; occurs rarely and irregularly (perhaps breeds) near San Marcos and Austin and in Colorado Co. (Eagle Lake). Recent records of breeding in coastal counties: Calhoun, Aransas, San Patricio, Nueces, Kenedy, and Cameron; in inland counties: Bexar, Jim Wells, Webb, Brooks, and Hidalgo. Formerly bred in Colorado Co., Eagle Lake (nest with 1 egg found, 1924, J. H. Baker) and Sabine Co., Bronson (eggs taken, Aug. 16, 1889, R. P. Sharples). *Dispersal*: Rare winter visitor (Nov. 20 to May 20) in Houston-Galveston-Freeport area of upper coast; casual in Big Bend Nat. Park (Tornillo Creek, 1 seen, May 25, 1901, H. C. Oberholser; along Rio Grande in park, 1 present, July 6, 1969–Jan., 1970, last seen in Rio Grande Village, photographed by Ty Hotchkiss, fide R. H. Wauer; Rio Grande Village silt pond, 1 seen, Apr. 15, 1971, Wauer) and at Waco (1 seen, Nov. 17, and Dec. 21, 1961, Lillian M. Brown); accidental at Dallas (1 seen, Sept. 6, 1969, Hazel Nichols, Ada Henderson) and in Roberts Co. (seen Aug., 1934, H. F. Saunders).

HAUNTS AND HABITS: The Mexican Least Grebe is first on the phylogenetic list of special birds which have made the lower Rio Grande region of south Texas famous for a century—chauvinistic ornithologists and bird watchers continue to insist that their Mexican birds be a few yards within the U.S.A. instead of a few meters inside Mexico. *Limnodytes dominicus*, smallest of the Western Hemisphere grebes, has a wide



distribution in the lowlands of the American Tropics, including the West Indies. It haunts freshwater lakes, ponds, sluggish parts of rivers or streams, resacas, even roadside ditches, in either woodlands or open country with or without shoreline or emergent vegetation. This grebe is noted for its strong adherence to small bodies of fresh water at all times of the year. There is no true migration, but localized, largely nocturnal dispersals are apparently frequent, especially when birds are recolonizing ponds that have refilled after a dry spell. Niches created by dams and other man-made impoundments are readily filled by *L. dominicus*.

Most of the Least Grebe's time is spent on or under the water. Seldom seen on the wing, this extremely skulky grebe prefers to dive or sink; sometimes it emerges unseen beneath shoreline vegetation. When hard pressed, it may, after a skittering taxi, fly briefly and low over the water. Small groups, perhaps members of a family, swim together in fall and winter. During the nonbreeding season, it also feeds with other grebes, coots, gallinules, teals, and Ruddy Ducks. The Least is largely insectivorous; in Texas it eats various aquatic beetles—predaceous diving beetles (Dytiscidae), water scavenger beetles (Hydrophilidae), crawling water beetles (Haliplidae); also bugs—giant waterbugs (*Belostoma*), water boatmen (Corixidae), backswimmers (*Buenoa* and *Plea*). At times, like other grebes, it eats feathers.

In alarm, the Least Grebe utters a ringing *beep* or *peet* or a reedy *queek*; sometimes in distress, *beep*'s are sounded continuously. When in danger or in defense of territory, a bird signals with a chattering *ye-ye-ye-ye-ye-ye-ye-ye-ye-ye-e-e-e-e-e-e*; a nasal *yank yank* is perhaps the "all clear" note.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN LEAST GREBE, *Limnodytes dominicus brachypterus* (Chapman)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Pileum glossy deep chaetura black; rest of upper parts chaetura drab with greenish gloss, but rump rather more brownish and bases of feathers on this part white; wing-quills fuscous, but middle secondaries mostly white on inner webs; chin and upper throat dull chaetura black or fuscous black; sides of head and foreneck deep mouse gray; upper breast fuscous; crissum and sides light fuscous; remainder of breast and abdomen white, more or less mixed with fuscous. Bill black, but with tip paler, mandible sometimes mottled with flesh color; iris orange or bright yellow; legs, feet, and loreal space black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but chin and throat more or less mixed with white and posterior lower parts more clearly white. Bill grayish brown above, yellowish below. *First nuptial:* Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter:* Acquired by wear from juvenal. Apparently same as juvenal. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller; upper parts more brownish and with less greenish gloss; foreneck and sides of head hair brown or drab; chin and upper throat white or yellowish white. *Natal:* Top of head dull black with light streak of whitish interrupted by triangular or V-shaped spot of cinnamon; remainder of upper parts fuscous, slightly mixed with white, sides and back of head and neck irregularly striped

with white; chin and throat broadly striped with white and hair brown; jugulum hair brown, faintly striped with white; sides hair brown; lower abdomen and crissum drab; rest of lower parts white. Bill bluish flesh color mottled with black; bare space on lores dull orange; iris brownish black; legs and feet blackish plumbeous.

MEASUREMENTS: *Adult male:* Wing, 82.0–89.9 (average, 86.9) mm.; tail, 23.9–34.5 (29.2); bill (exposed culmen), 19.0–24.9 (21.9); height of bill at base, 8.1–8.9 (8.6); tarsus, 29.9–34.0 (32.5); middle toe without claw, 32.0–37.6 (35.3). *Adult female:* Wing, 83.1–90.9 (86.9); tail, 17.0–33.0 (23.4); bill, 18.0–22.6 (19.8); height of bill, 7.1–8.9 (7.9); tarsus, 30.7–34.0 (32.3); middle toe, 32.0–37.1 (34.8).

RANGE: S. Texas, south on both slopes of Mexico (excluding s. Baja California and Sonora on the west) and through Isthmus of Tehuantepec, Yucatán Peninsula, and Central America to Panama.

TEXAS: Resident: Collected northwest to La Salle, east to Refugio, south to Kenedy, Cameron, and Hidalgo cos. *Dispersal:* Bird found dead (specimen?) in Brazoria Co., Velasco (Oct. 4, 1948, J. M. Heiser, Jr.).

NESTING: *Nest:* Amid vegetation of lakes, ponds, and marshes; floating or anchored to vegetation; raft of reeds, leaves, and other water vegetation; lined with similar materials. *Eggs:* 3–6, usually 4–5; elliptical oval to oval; chalky greenish white, bluish white, cream buff, or dull brown (between sayal brown and clay color); unmarked save for nest stains; average size, 33.8 × 23.4 mm.

WESTERN GREBE, *Aechmophorus occidentalis* (Lawrence)

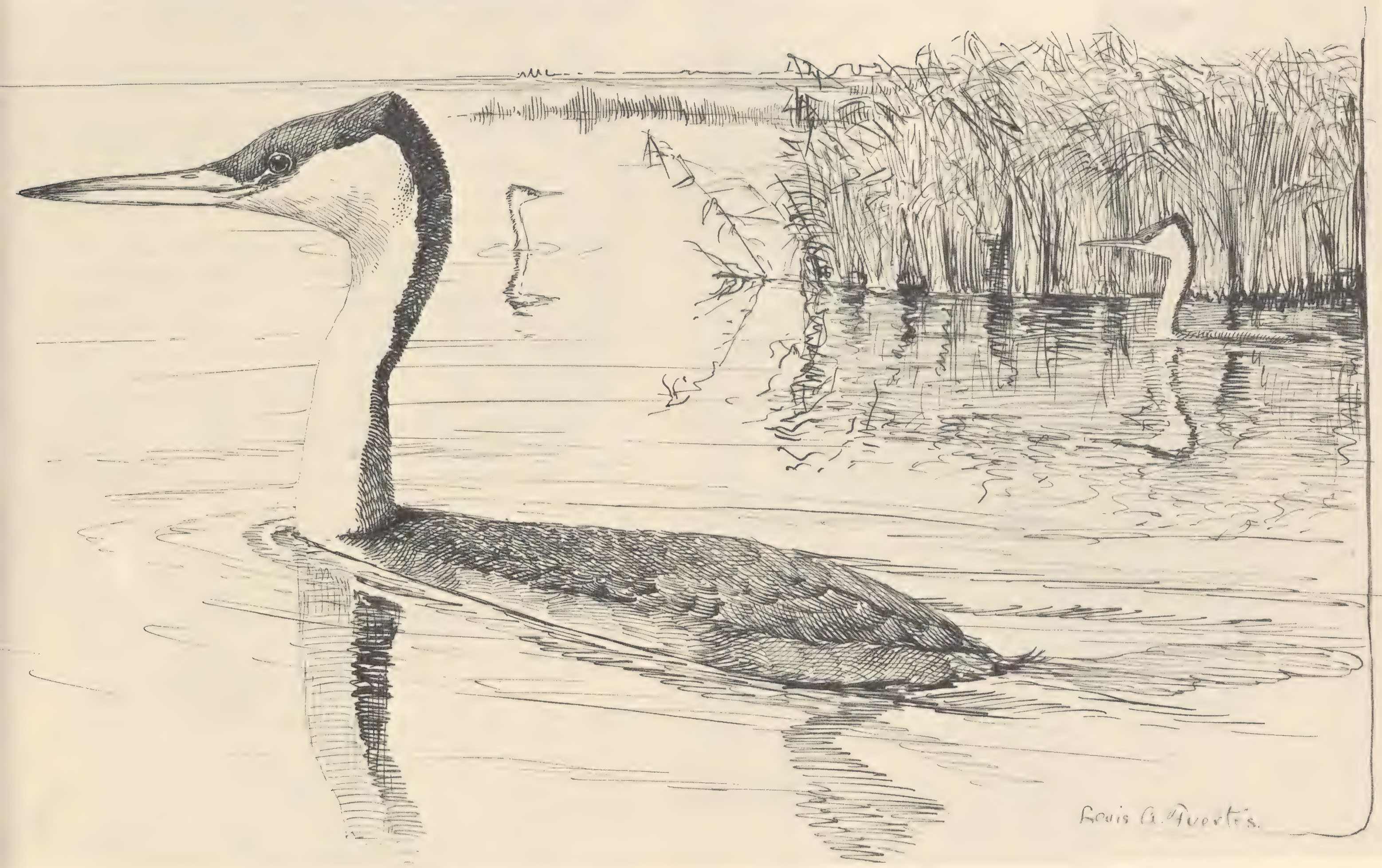
SPECIES ACCOUNT

Also known as Swan Grebe. A very large grebe with long, daggerlike yellowish bill (slightly upturned in female); long swanlike neck; in flight, shows white wing-stripe. Black crown and hindneck, becoming dark gray on back and wings; white cheeks, throat, front and sides of neck, and under parts. Length, 24¾ in.; wingspan, 33¾; weight, 1½ lbs.

RANGE: C. Alberta to s. Manitoba, south locally to s. British Columbia, Washington, Oregon, California, Nevada, n. Utah, Idaho, w. Wyoming, Montana, and n. North Dakota, even more locally east to Colorado, Nebraska, South Dakota, and s.w. Minnesota; a very isolated resident colony on Mexico's Lago de Chapala in states of Jalisco and Michoacán. Winters chiefly coastally from s.e. Alaska to Baja California and adjacent coast of mainland Mexico to Jalisco, also locally inland in lesser numbers in Central Valley of California, Great Basin states, Arizona (Colorado River region), Texas (a very few), Chihuahua, Zacatecas, Guanajuato, Valley of México, and Puebla.

TEXAS: (See map.) *Winter:* Sept. 30 to May 27; lingered once to June 27. Scarce and very local in Trans-Pecos—more or less regular only on Balmorhea Lake, Reeves Co. (1 collected, Oct. 21, 1969, Joe Robinette; Sul Ross State University collection, no. 369); rare to casual elsewhere throughout state east to about 95th meridian. One specimen from eastern quarter: Nacogdoches Co., Sam Rayburn Lake (Oct., 1972, C. D. Fisher; Stephen F. Austin University collection).

HAUNTS AND HABITS: The Western Grebe is an unmistakable bird. This largest, most graceful, and most



Western Grebe, *Aechmophorus occidentalis*

gregarious of North American grebes breeds in colonies on fresh, occasionally brackish, waters. These must be large and open enough for the species' spectacular nuptial-season races but with sufficient cattails (*Typha*), bulrushes (*Scirpus*), and similar vegetation for nest anchorage. The often tightly spaced nest platforms float in water (sometimes as deep as ten feet) and are secured to the emergent vegetation or are constructed atop submerged plants. Downies that hatch from eggs in these soggy nests are solid gray and white, without the stripes and spots found in chicks of other grebe species. A well-marked postbreeding dispersal is not typical of the Western Grebe, but vagrants have made their way to southern Ontario, Pennsylvania, South Carolina, and Florida. Chief winter quarters along or near the Pacific coast are in sheltered bays or inlets. However, the Western often floats and dives just seaward of thundering surf. Migrants fly overland by night, but some pass along coasts by day.

Fish form the essential part of the Western Grebe's diet (81 percent in examined stomachs of California individuals). A sampling of stomach contents also showed that some fish had a small hole through the center of the body, which suggests the bird may use its daggerlike bill as a spear in capturing prey. Individuals usually feed alone but congregate on water in rafts at night. On calm waters the Western Grebe slips underwater as if without effort, but in choppy waters it plunges with an energetic spring. Prime feeding times—when sunlight strikes the water at highly acute angles—are in the morning up to about 9:00 A.M. and in the afternoon after 2:00 P.M. The Western Grebe eats carp, mullet, chub, catfish, perch, bluegill, smelt, cabezon, herring, and roe; insects, of secondary importance, include grasshoppers, mayflies, water boat-

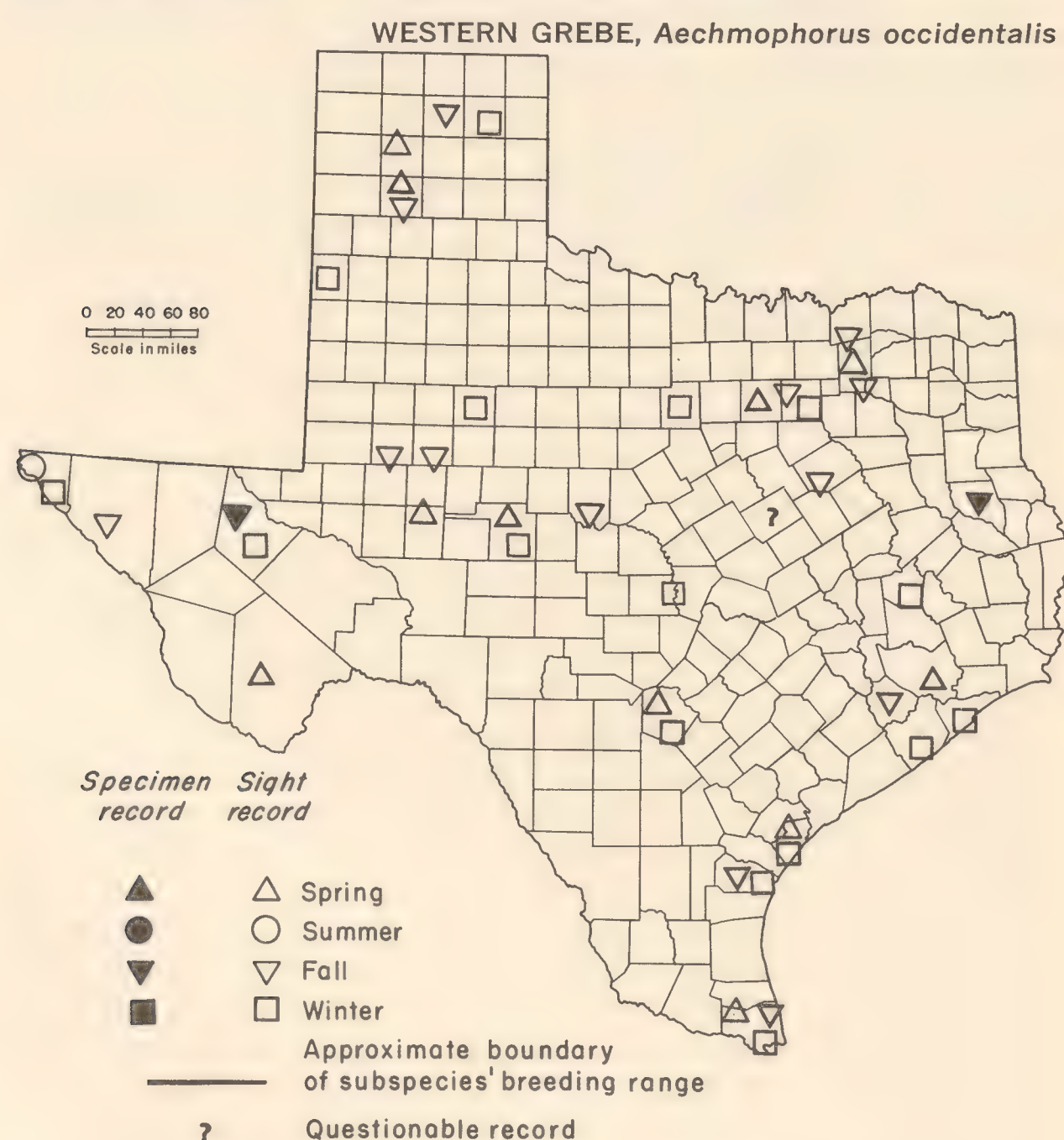
men, gnat larvae, and aquatic beetles. Feathers also are eaten; perhaps these are especially useful to the Western Grebe as internal strainers of sharp fish bones. Nesting birds in an atypical dryland colony at Old Wives Lake, Saskatchewan, in the late 1950's were observed running rapidly on the ground on tiptoes for several yards in more or less erect posture; less eccentric Western Grebes apparently progress on land, where they seldom venture, by shoving along on their breasts.

A loud, rasping, far-carrying *crik crik* and *c-rr-e-ee-rr-e-e* are the standard Western Grebe vocalizations. The latter, however, is quite variable and has been rendered as *mar-quer-ite*, *her-cu-les*, *mer-cur-y*, *re-kee*, *kree-kree*, and *kree*. Pairs, at times, converse with soft low *ker-ker-ker*'s. One peculiar call is said to suggest a whistling teakettle.

CHANGES: The Swan Grebe has suffered much with the coming of civilization. During the last half of the nineteenth century and up to the summer of 1903, many thousands of Western Grebes were shot for their beautiful, satiny, furlike feathers; skins and feathers were manufactured into caps, capes, and coats. In the twentieth century, pesticides and oil spills have killed additional thousands. All this grisly slaughter has had no effect in Texas except to change a scarce visitor into a rare, increasingly casual, one.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Pileum black; hind-neck chaetura black; remainder of upper parts dark chaetura drab, feathers with distinctly paler edgings; wings hair brown or light fuscous, bases of inner webs of primaries, bases of outer webs of secondaries and most of inner webs of secondaries, except on innermost feathers, white; wing-coverts dark hair brown with slightly paler edgings; lores and infraocular regions deep smoke gray; sides and flanks chaetura drab, edged with hair brown or mouse gray; remainder of lower parts pure satiny white. Bill dull naples yellow, but basal half of mandible dark pea green, culmen dark drab gray; roof of mouth olivaceous, rest of inside of mouth pale dull purple or lavender; iris carmine, rose red, scarlet, poppy red, or cadmium orange; legs and feet dull straw yellow, mottled with dull pea green and clove brown, somewhat yellowish on webs between toes, outer side and soles of feet blackish brown; claws yellowish pea green. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but pileum more brownish, upper parts somewhat lighter and more brownish, pale tips of feathers broader. Bill dull light yellow or olive yellow, but culmen blackish olive green, broad longitudinal space on side of basal two-thirds of mandible dark olive green, and tip of mandible orange; iris carmine, with whitish inner ring; tarsus and toes dull olivaceous yellow, outer side of tarsus and joints of toes brownish black. *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but bill much more slender, shorter, and somewhat recurved; upper parts including pileum rather lighter, more brownish, about as in adult male in winter. Culmen olivaceous black; mandible, tip, and cutting edges of maxilla dull yellow; iris scarlet or cadmium orange, bare area on lores plumbeous. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, first nuptial:* Acquired by partial prenuptial molt from first winter. Practically identical with corresponding nuptial adult. *Male and female, first winter:* Identical with juvenal, which is worn until first prenuptial molt. *Juvenal:* Acquired by complete post-



natal molt. Similar to nuptial adult female, but lores white or whitish; upper parts averaging paler; crown chaetura black; remainder of upper parts light hair brown to dark hair brown. Bill clove brown, tipped with yellowish white; iris broccoli brown; legs and feet externally sage green to plumbeous, internally olive yellow.

MEASUREMENTS: *Adult male:* Wing, 192.0–214.1 (average, 199.9) mm.; tail, 33.0–47.0 (42.2); bill (exposed culmen), 65.0–78.5 (74.2); height of bill at base, 14.0–16.5 (15.0); tarsus, 75.9–82.0 (78.7); middle toe without claw, 63.5–71.7 (66.8). *Adult female:* Wing, 172.0–186.2 (179.8); tail, 31.0–42.9 (38.1); bill, 56.4–66.0 (61.2); height of bill, 10.9–13.7 (11.9); tarsus, 69.1–74.9 (71.9); middle toe, 57.9–65.0 (61.2).

TEXAS: *Winter:* Two specimens (see species account).

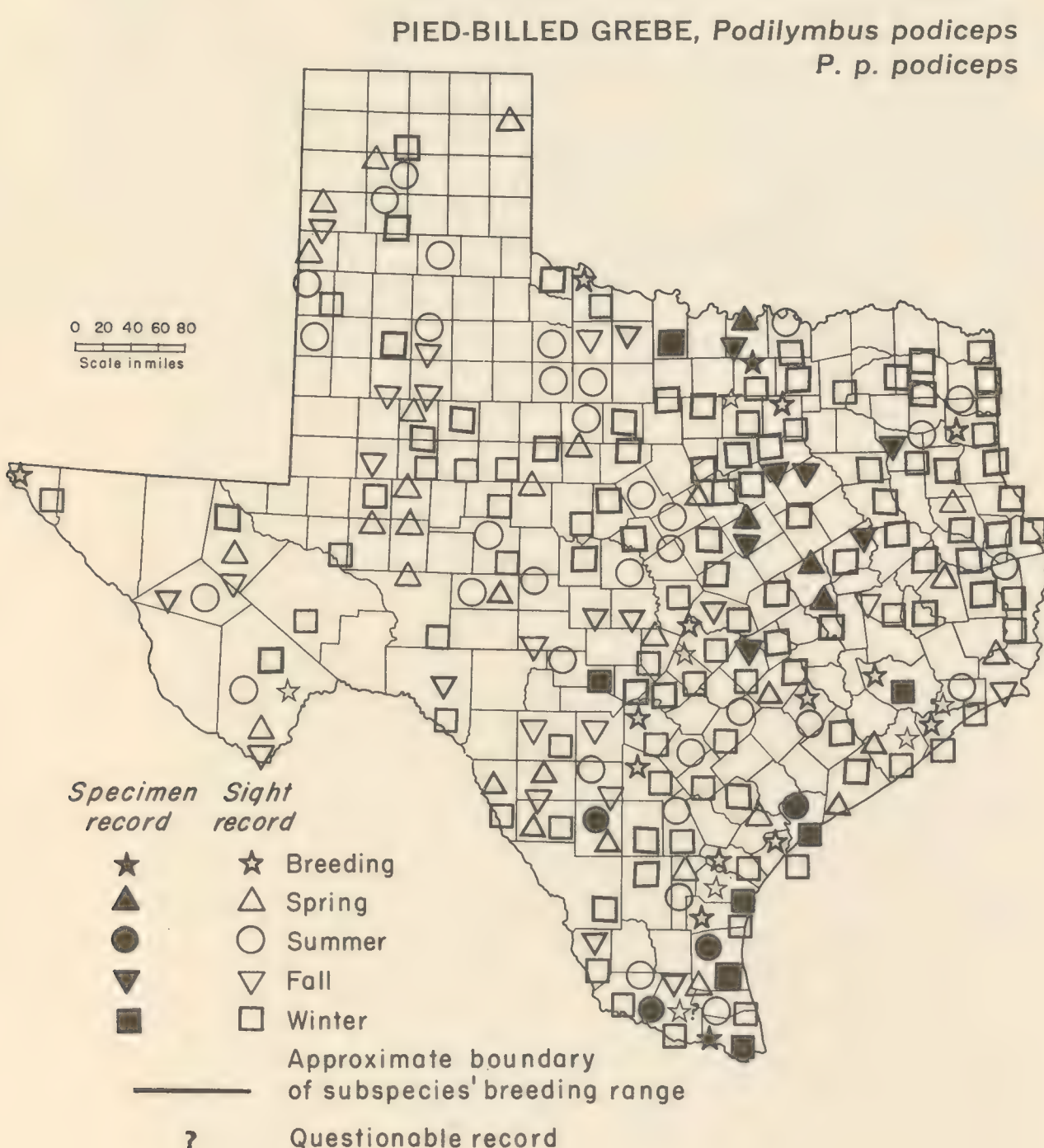
PIED-BILLED GREBE, *Podilymbus podiceps* (Linnaeus)

SPECIES ACCOUNT

A small plump grebe with a short thick “chicken” beak (breeding bird has medial black ring around whitish bill); dark brown eyes. *Nuptial adult:* dark brownish above with black throat-patch; mainly white below, including crissum (this conspicuous when bird swims with tail high). Unlike other U.S. grebes, shows no prominent white patch on spread wing. *Winter adult:* lacks bill-ring; has whitish throat. *Immature:* shows brown and white stripes on sides of head and neck. Length, 13¼ in.; wingspan, 22¼; weight, 13½ oz.

RANGE: Locally throughout most freshwater areas of Western Hemisphere, from Canadian provinces, south through the United States, Mexico, West Indies, and Central America to c. Patagonia. In winter, individuals withdraw from most of Canada and n. United States, excepting Pacific Northwest.

TEXAS: (See map.) *Breeding:* Mar.—occasionally



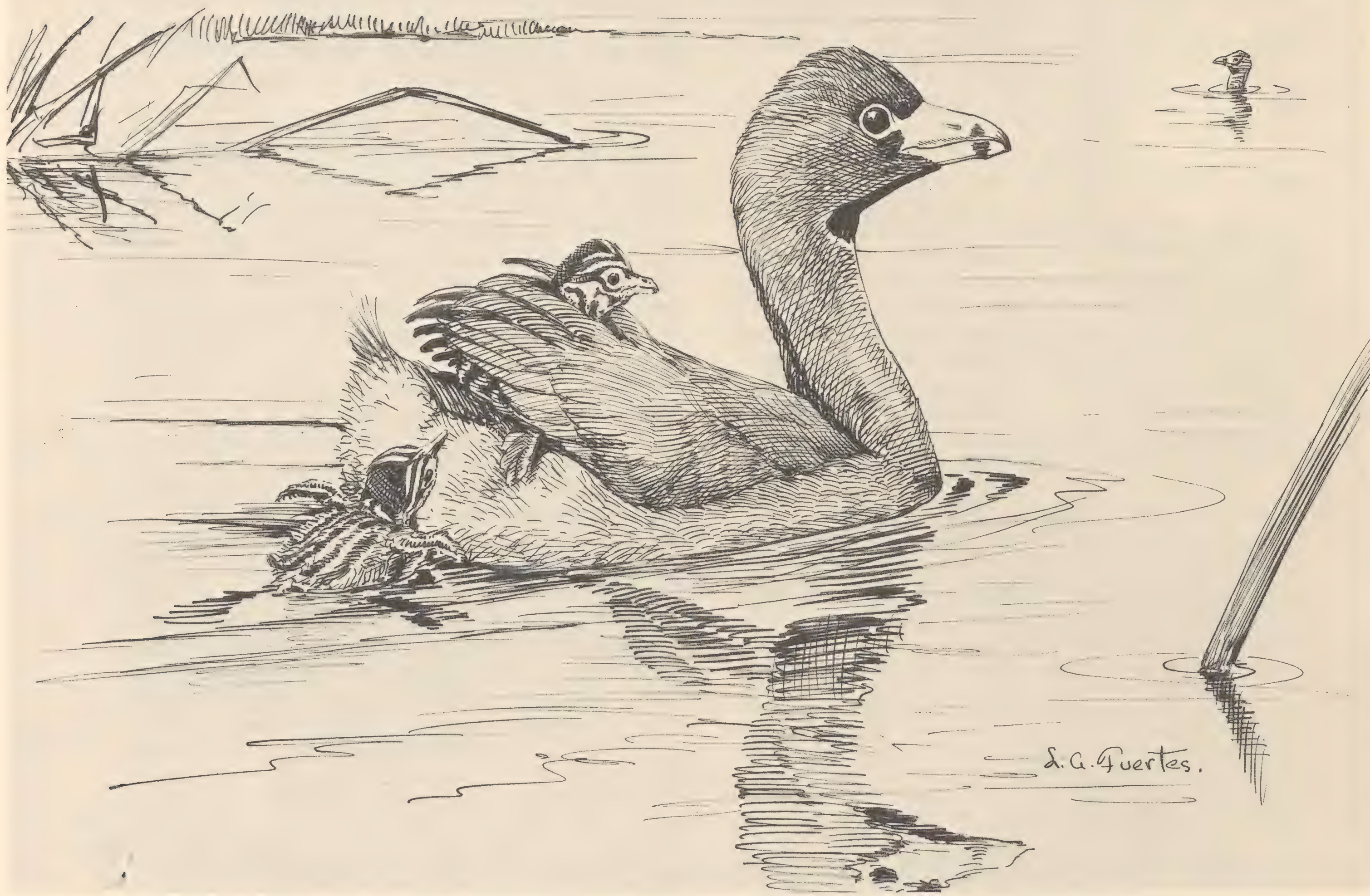
Feb.—to Sept.—occasionally to Dec., at least once to Jan. (eggs, Mar. to Aug. 25; small young, Feb. 22 to Jan. 17). Locally and irregularly uncommon to rare over eastern half west to about 99th meridian; summers rarely in western half, but breeding reported only from El Paso, where scarce, and Big Bend Nat. Park (nested and fledged 4 young, 1967; nested, 1970, R. H. Wauer). Nonbreeding summer lingerers also occur irregularly throughout breeding range. *Winter:* Late July to mid-May (extremes: July 1, May 30). Common to fairly common east of 100th meridian and north to about 33rd parallel; locally fairly common to rare west and north of above.

HAUNTS AND HABITS: The rotund and hardy Pied-billed Grebe, ranging from Canada to Patagonia, is the most widely distributed of the strictly New World grebes. It is also the only representative of its family that is widespread as a breeder in the eastern United States, including Texas. The Pied-bill is usually shy during the nesting season. A pair of this nonsocial species secludes itself on a pond, marsh, or slough with plentiful shoreline and emergent vegetation—commonly cattails or reeds.

Breeding haunts and habits of *Podilymbus podiceps* in Texas have seldom been described. H. C. Oberholser related activities of a female with her brood on a shallow prairie pond about twenty miles southwest of Vernon, Wilbarger County. Here, on August 2, 1938, R. L. More observed a female and six young about two or three days old in and about a nest. The next day, Oberholser, in company with More and G. E. Maxon, found these birds at the same place. The pond was approximately five hundred feet long and one hundred feet wide; one end of it had many dead and living mesquite bushes among which the nest was anchored. When the three men approached, the female was swimming about in the water and did not appear to be particularly shy. Before being disturbed, she swam about with the young following or around her. Her low note, something like *krr-r-r-uk*, was a signal for the young to come closer; sometimes all climbed on her back for a ride. When the adult was approached closely or pursued, all the young scattered and dived and she too disappeared by diving. After such a disturbance the birds were hard to find and much more difficult to approach. Following a period of quiet, the female again appeared and brought her brood together by her calls. The notes of the young birds at this time were weak *peep*'s, which they uttered particularly in response to the mother's calls or sometimes when following her.

In transit and on winter waters, the Pied-bill remains relatively nongregarious but is less shy and often appears on expanses of sparsely vegetated water—lakes, rivers, man-made impoundments—as well as brackish, and occasionally salt, water along coasts. The present species is typically the last grebe to leave northern portions of its range in fall and the first to return in spring.

Podilymbus podiceps rarely takes wing except dur-



Pied-billed Grebe, *Podilymbus podiceps*



PLATE 1: male Mallard, *Anas platyrhynchos* (left), male Black Duck, *Anas rubripes* (right)
(in background: female Mallard, left; female Black Duck, right)

ing the nocturnal migrations. Migrants prove their flying stamina by regularly going overseas to Bermuda, 580 miles off the eastern U.S. coast; one even crossed more than 3,000 miles of open Atlantic to the Azores Islands. Apparently the Pied-bill seldom, if ever, swims on oceans or other rough water, but on quiet lakes and ponds it is a master of floating (at any level) and diving. A wary bird sinks quickly and quietly; then it barely raises its head and bill above the surface to scan its surroundings or swims underwater to cover before emerging, frequently unseen. Important food items for the Pied-bill are insects (dragonflies, grasshoppers, water boatmen, backswimmers, wasps, bees, ants, others), crayfish, tadpoles, and various small freshwater fish. Occasionally it eats a spider or snail. Like other grebes, it eats its own feathers, sometimes even feeding them to its young. Fortunately, considering this habit, grebes have an extraordinary number of feathers; one Pied-bill had 15,016.

The standard vocalization, probably given only by the male, is a loud, very discordant, description-defying call concluding with a series of cuckoolike *pow*'s or *wup*'s. The female, especially if she has downy young, sometimes answers with a low harsh grunt. The Pied-billed Grebe is usually silent away from the nesting pond.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN PIED-BILLED GREBE, *Podilymbus podiceps podiceps* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Pattern of male slightly more clearly marked. Acquired by partial prenuptial molt. Upper parts fuscous or fuscous black; wings fuscous; parts of middle secondaries, chiefly on tips and on inner webs, white; sides of head mouse gray; chin and middle of throat dull black; lower part of throat and sides of neck dull wood brown; jugulum and sides chaetura black; flanks and crissum fuscous; jugulum, sides, flanks, and crissum mixed with white or with conspicuous white edgings on feathers; middle of breast and abdomen white, more or less mixed with chaetura drab. Bill white or bluish white, with broad black band across middle, anterior portion strongly shaded with bluish slate, and culmen olivaceous; iris prout brown or vandyke brown, with narrow

outer ring of ochraceous white; eyelids white; tarsus and toes greenish slate color or olive buff on inner surface. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts similar to nuptial adults, but anteriorly more brownish, sides of head wood brown; throat, jugulum, and sides of neck and of body dull cinnamon; lower mantle fuscous. Bill brownish, without black band. *First nuptial:* Acquired by partial prenuptial molt from first winter. Like nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to juvenal but lacks white stripes on head and neck. *Juvenal:* Acquired by complete postnatal molt. Upper parts fuscous, rather lighter than that of adults in winter; sides of head and of neck wood brown; throat and jugulum light wood brown or wood brown, jugulum mixed with fuscous; sides of head and neck irregularly and broadly striped with white; chin and middle of upper throat white like middle of posterior parts; sides of body dull cinnamon. Bill brownish slate or brownish black above, mandible buffy or light brown; iris raw umber, sepia, or wood brown; legs and feet yellowish olive gray or greenish slate on inner side, slate black on outside. *Natal:* Upper parts glossy black; neck and back striped with white or grayish white; crown striped with white and variegated with patches of walnut brown or burnt umber; sides of neck and throat mixed black and white; sides of body washed with brownish; remainder of lower parts grayish or buffy white. Bill and bare lores dull yellow; culmen, tip of bill, and narrow line near base of mandible black; iris dark brown; tarsus and feet greenish black.

MEASUREMENTS: *Adult male:* Wing, 120.9–141.5 (average, 132.3) mm.; tail, 33.0–47.0 (40.6); bill (exposed culmen), 20.6–25.9 (22.6); height of bill at base, 11.4–13.5 (12.4); tarsus, 41.9–46.5 (43.2); middle toe without claw, 48.5–57.4 (51.8). *Adult female:* Wing, 110.5–129.0 (122.2); tail, 20.6–39.1 (28.2); bill, 17.0–21.1 (19.8); height of bill, 9.9–11.9 (10.7); tarsus, 35.6–42.9 (38.9); middle toe, 42.9–50.5 (47.3).

RANGE: C. British Columbia and n. Manitoba to Nova Scotia, south to Baja California, Guanajuato, Tamaulipas, U.S. Gulf states, and Florida; also Bahamas. Winters from s. British Columbia, n. Utah, Texas, Tennessee, and New Jersey through Mexico to Panama.

TEXAS: *Breeding:* Collected in Denton and Cameron cos. *Winter:* Taken north to Clay, east to Harris, south to Cameron, west to Kerr cos.

NESTING: *Nest:* Amid cattails, tules, or other vegetation; in marsh, pond, or other body of water; raft, floating or anchored to vegetation, bulky, with shallow depression; composed of reeds, flags, grasses, moss, and other vegetation; lined with similar material. *Eggs:* 3–10, usually 5–7; ovate or elliptical oval, sometimes nearly fusiform; dull bluish white or olivaceous white; unmarked, but often nest stained; average size, 43.2 × 29.9 mm.

[Albatrosses: Diomedidae

YELLOW-NOSED ALBATROSS, *Diomedea chlororhynchos* Gmelin

Has albatross characteristics: long hooked bill with small nostril tube on each side of upper mandible; very long, sabrelike wings; large webbed feet; brief tail. *Adult*: distinguished chiefly by golden culmen atop black bill; sooty brown back, dorsal wing surface, and tail; white head (sometimes washed with gray), rump, and under parts (including wing-linings). *Immature*: similar but has all-black bill. Length, 32 in.; wingspan, 6½ ft.

RANGE: Islands near lat. 40° S. in Atlantic (Tristan da Cunha and Gough Island) and Indian (St. Paul Island) oceans. Ranges these oceans north to vicinity of Equator and south to lat. 50° S.

TEXAS: *Hypothetical*: One sighting: Cameron Co., South Padre Island jetties, Port Isabel (May 14, 1972, Mr. and Mrs. James L. Marshall). The observers reported that the day was one of "very strong easterly winds" and that Laughing Gulls were harassing the al-

batross. Marshall was able to approach the bird to within 15 ft., and he made detailed drawings which were subsequently submitted to F. S. Webster, Jr., south Texas editor of *American Birds* (formerly *Audubon Field Notes*).

It is noteworthy that the first albatross confirmed in the Gulf of Mexico was also a Yellownose. This individual was photographed in color at Holly Beach, Cameron Parish, Louisiana, May 9, 1970, by James W. McDaniel (see *Audubon Field Notes* 24 [1970]: front cover, pp. 573, 616). Apparently, in order to see an albatross in the Gulf of Mexico, it is necessary to be named James and to observe in a minor political subdivision named Cameron!

According to the A.O.U. check-list, 1957, *Diomedea chlororhynchos* is the only albatross recorded in U.S. Atlantic seas. This is reasonable since the Yellownose is somewhat more tolerant of warm water than are most other members of its family; thus, it is more likely to cross the tropical sea barrier that separates the South from the North Atlantic.]

Shearwaters: Puffinidae

SOOTY SHEARWATER, *Puffinus griseus* (Gmelin)

SPECIES ACCOUNT

A rather gull-like sea bird, but with slimmer wings and much shorter, narrower tail. Glides low over water, often seeming to shear it with tips of stiffly held wings. Grayish black above and below with grayish white wing-linings. Length, 18½ in.; wingspan, 3½ ft.; weight, 1¾ lbs.

RANGE: Islands in subantarctic waters offshore from s.e. Australia, Tasmania, New Zealand, Chile, and Argentina. In winter (summer in Northern Hemisphere) wanders on and over the world's oceans to approximately lat. 50° N.; avoids tropical waters.

TEXAS: *Casual:* Three records: Aransas Co., Rockport Harbor (1 discovered, June 12, 1937, and seen daily, June 12–20, A. W. Collier; also seen, June 15–18, by Connie Hagar, Miss A. R. Jackson, Mr. and Mrs. C. T. Gill, and others; photographed on June 18 at very close range by Gill); Nueces Co., Port Aransas, South Pier (1 found dead, June 19, 1952, H. H. Hildebrand; specimen in Texas A&M University collection, no. 9081); Padre Island, county unknown ("birds seen," Apr. 26, 1951, Sam Chamberlin, fide L. R. Wolfe).

HAUNTS AND HABITS: The cosmantine Puffinidae (usually called Procellariidae) is a family of slim-winged, gull-sized pelagic birds whose unsettled world membership varies with ornithologists from fifty-six species (Van Tyne and Berger) to thirty-three (Mayr and Amadon); W. R. P. Bourne suggests forty-five. It is an occasion for celebration when any one of these far-flung, open-sea birds makes its way to the cloistered Texas Gulf coast, which is supremely unsuited to the tubenoses—albatrosses, shearwaters, and petrels. In fact, the headquarters of these pelagic, saltwater-drinking birds is in the far Southern Hemisphere. Here the West Wind roars clear around the world, driving oxygen into cold, plankton-rich ocean water and creating ideal over-wave soaring conditions for shearwaters and their kin.

The Sooty is a cold-water shearwater which breeds from November to March—the Southern Hemisphere summer—on subantarctic islands. In colonies, each pair incubates its one white egg in a nest burrow tunneled one to four feet deep in vegetated soil. On its way to winter waters in the northern Pacific and north-

ern Atlantic, the Sooty migrates rapidly, probably non-stop, over tropical oceans. As a rule, this species is to be expected closer to coasts than most other shearwaters. In the Pacific, where *Puffinus griseus* is more common, it flies in large, streaming flocks or rests in groups on the water; in the Atlantic, it occurs usually by twos and threes.

Shearwater flight, low over the water, is a series of flaps interspersed with glides on stiff wings. Various shearwater species often gather at fishing banks, where they eat chiefly cephalopods and fish. On the Atlantic, squid (*Loligo*) is the preferred food of the Sooty, but small fish (capelin, sand lance, and anchovies) and some crustaceans are taken. Oily food is especially relished by shearwaters and petrels. Prey is picked up with the bill on, or just below, the water's surface, but the Sooty also makes clumsy shallow dives, aided by strong strokes of its wings. Birds which have landed aboard ships have been observed to walk with shuffling steps, fast but awkwardly in half-erect stance.

The only observations of activities of a Sooty Shearwater in Texas were made of the one individual that visited Rockport Harbor in June, 1937 (see TEXAS section). This bird made a practice of diving for bits of meat and fish thrown to it but paid no attention to shrimp thus offered. Once the Sooty swam up to a boy fishing from a pier and ate from his hand. The boy even put his hand on the bird, but the hand was withdrawn when the shearwater struck at it with its hooked beak.

At sea, the Sooty Shearwater is rather quiet. However, on the nesting islands, especially at night, birds raucously growl, groan, scream, and cackle. Crooning notes also issue from the nest burrows.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper parts fuscous black to brownish black, tips of feathers on back, rump, scapulars, and upper tail-coverts fuscous to fuscous black; tail brownish black, inner webs of more outer feathers somewhat lighter; primaries black, inner edges of inner webs light fuscous; remainder of inner webs, except at tips, fuscous; secondaries, tertials, and upper wing-coverts fuscous black, narrowly edged and tipped with fuscous; sides of head and upper half of neck fuscous black; chin dull pale smoke gray; throat and jugulum dull mouse gray; remainder of lower parts between hair brown and fuscous; axillars like posterior lower parts; lining of wing dull brownish or grayish

white, much mixed with hair brown and light fuscous, sometimes largely in the form of tips of feathers and shaft markings. Maxilla deep mouse gray to plumbeous, but tip dull white and upper part of maxilla blackish mouse gray, mandible deep mouse gray to deep plumbeous; iris vandyke brown; legs and feet exteriorly and posteriorly blackish brown, remainder grayish lavender. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but edges and tips of feathers slightly lighter. *First nuptial*: Acquired by wear from first winter. Similar to nuptial adults, but sometimes lighter. *First winter* (juvenal plumage of most authors): Acquired by complete molt from juvenal. Similar to adults in winter, but edgings of upper parts much lighter, more conspicuous; lower parts more conspicuously tipped with lighter gray or brown.

MEASUREMENTS: *Adult male*: Wing, 278.9–316.0 (average, 294.1) mm.; tail, 82.0–90.4 (86.1); bill (exposed culmen), 39.9–46.0 (42.9); height of bill at base, 11.9–15.5 (14.2); tarsus, 57.9–62.0 (59.7); middle toe without claw, 55.1–58.9 (57.4). *Adult female*: Wing, 275.1–302.0 (291.3); tail, 82.6–95.0 (88.9); bill, 38.6–42.4 (40.6); height of bill, 11.9–15.0 (13.7); tarsus, 55.1–59.2 (57.4); middle toe, 53.1–57.9 (55.9).

TEXAS: *Casual*: One specimen (see species account).

AUDUBON'S SHEARWATER, *Puffinus lherminieri* Lesson

SPECIES ACCOUNT

Dusky Shearwater of some authors. A very small shearwater; flight noticeably more rapid and fluttery with shorter glides than that of larger members of the family. Sooty brown above; white below. Length, 12 in.; wingspan, 23¼.

RANGE: Islands in tropical seas around the world. Wanders during nonbreeding season over and on warm waters generally not far from nest stations.

TEXAS: (See map.) *Dispersal*: Early Mar. to late Sept. (extremes: Jan. 28, Nov. 19). *Casual* (11 definite

records, 6 of which are specimens). Recorded from Jefferson, Galveston, Brazoria, Aransas, Nueces, Kleberg, Kenedy, and Cameron cos. (See detailed account for specimen evidence.)

HAUNTS AND HABITS: Audubon's, like other shearwaters, has separate nostril tube openings on top of its bill. Its habitat, however, is unusual: It is a tropical, rather than cold-sea, pelagic. During the November-to-March breeding season it colonizes rocky, corally, occasionally turfy, islets, where a crevice, blanket of dense vegetation, or burrow in the ground serves for the nest. Although not truly migratory, birds disperse over their tropical waters but seldom stray far from the nest stations; there is, however, at least one record (in January) from the cold beach of England. Out to sea, the Audubon's generally wanders alone but occurs at times in small parties.

This very small shearwater—only the Little Shearwater, *Puffinus assimilis*, is tinier—alternates rapid flaps (6 or 7 times) with glides (for 3 or 4 seconds) as it flies low over the water. It is a buoyant and eager swimmer; it is also said to dive. With raised wings, it alights and runs about on drifting seaweed (chiefly sargassum weed) where it forages. The Audubon's is not a ship follower like some of its relatives. Food for both young and adults appears to be various cephalopods, such as squid and cuttlefish. Birds have been known to die gorging on sardines.

The "cat howls" and melancholy twitters of the Audubon's Shearwater are unlikely to be heard except at night on the breeding islands.

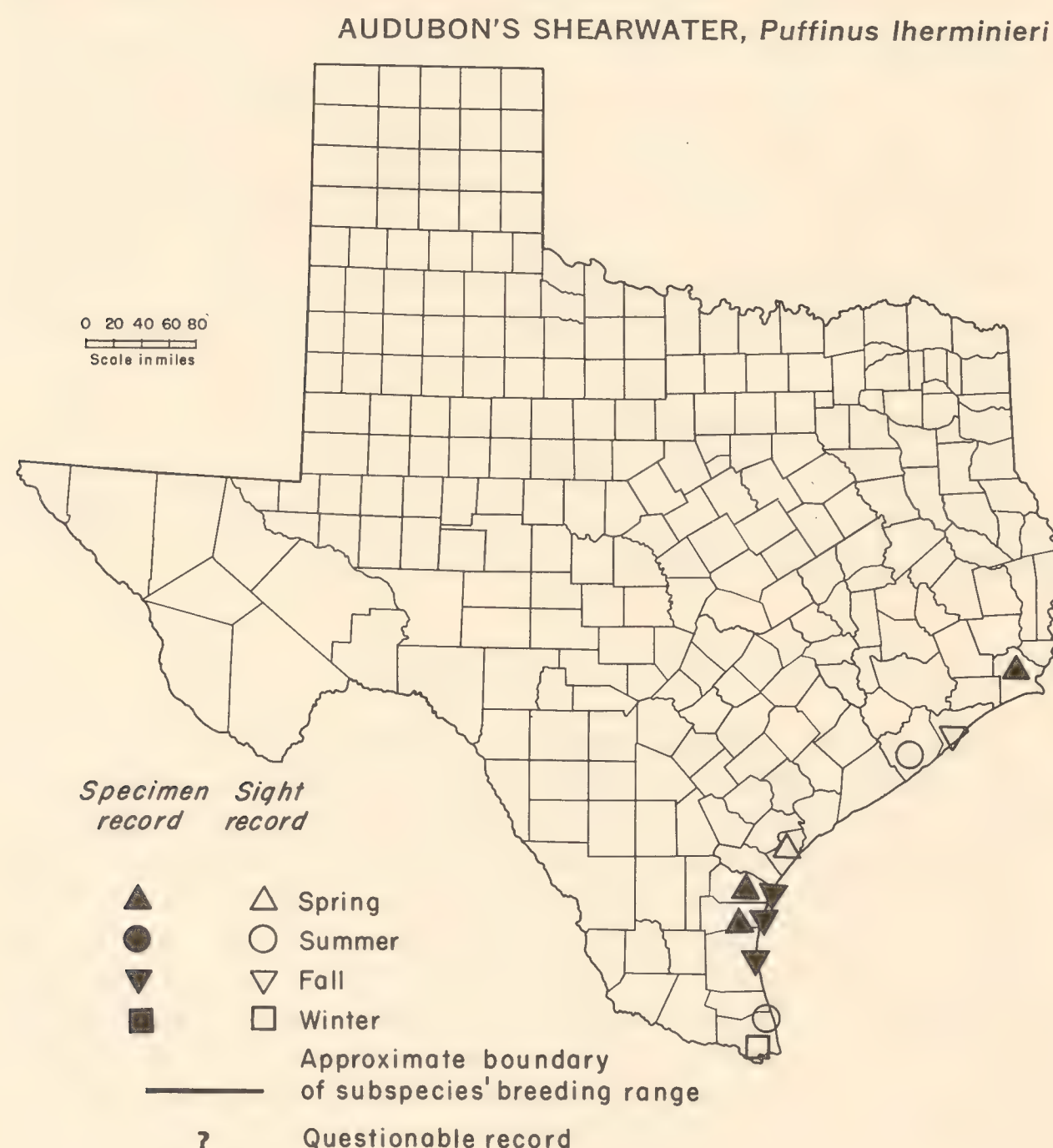
DETAILED ACCOUNT: ONE SUBSPECIES

ATLANTIC AUDUBON'S SHEARWATER, *Puffinus lherminieri lherminieri* Lesson

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Upper parts, including wings and tail, chaetura black; inner edgings of primaries rather paler; sides of neck and postocular region deep neutral gray, somewhat mottled with white edgings of feathers; crissum white anteriorly, posteriorly chaetura drab; lining of wing white; axillars white, slightly mottled terminally with deep neutral gray and edge of wing conspicuously mottled with white and deep neutral gray; remainder of under surface white. Bill plumbeous, more blackish at tip; inside of mouth and edges of eyelids light dull blue; iris bluish black; toes and outer portion of tarsus bluish black; inner side of tarsus and webs of toes pale yellowish flesh color; claws bluish black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but upper parts somewhat darker and more sooty (less brownish). *First nuptial*: Acquired by wear from first winter. Similar to nuptial adults, but bill somewhat lighter below. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt from juvenal, with which it is practically identical. Similar to adults in winter, but rather darker above, including wings. Mandible, except blackish tip, flesh color or pale dull yellow.

MEASUREMENTS: *Adult male*: Wing, 200.9–207.0 (average, 204.0) mm.; tail, 85.6–93.0 (90.2); bill (exposed culmen), 27.9–33.0 (30.2); height of bill at base, 8.1–10.4 (9.7); tarsus, 39.6–42.4 (40.6); middle toe without claw, 38.1–40.9 (39.6). *Adult female*: Wing, 194.1–210.1 (200.7); tail, 85.6–92.5 (90.2); bill, 27.9–29.9 (29.2); height of bill, 8.9–10.9 (9.7); tarsus, 40.4–41.9 (41.1); middle toe, 38.6–40.9 (40.1).

RANGE: Bermuda (extremely rare), Bahamas, Virgin Islands,



Lesser Antilles (locally), Old Providence Island, cays off Valiente Peninsula on Caribbean coast of Panama, and islets off Tobago. Wanders in tropical waters during nonbreeding season; occurs casually along U.S. coast from New Jersey to Florida and Texas, south to Guyana.

TEXAS: *Dispersal*: Six specimens: Jefferson Co., Sabine Pass (May 27, 1929, Bessie Reid; verified by H. C. Oberholser); Nueces Co., near Port Aransas (dead bird washed up on beach, Apr. 29, 1955, Connie Hagar; Louisiana State University collection); Nueces Co., n. Padre Island (12 found dead after Hurricane Beulah of which 1 female preserved, Sept. 23, 1967, Bud

Martin, identified by C. Cottam; Welder Wildlife Refuge collection, no. 1433); Kleberg Co., Padre Island, 15 mi. south of Bob Hall Pier (male found dead, Apr. 26, 1964, G. W. Blacklock; Welder collection, no. 900); Kleberg Co., Padre Island, 20 mi. south of Bob Hall Pier (female, Sept. 23, 1967, D. C. Carter; Texas A&M University collection, no. 7170); Kenedy Co., Padre Island (male found dead on beach after cold front, Nov. 19, 1968, Bud Martin; Welder collection, no. 1524). Three found dead (specimens?): Galveston Co., Galveston Island (1 on Sept. 17, another on Sept. 20, 1961, L. E. Williams, Jr.); Cameron Co., Brazos Island (Jan. 28, 1947, C. T. Gill).

Storm Petrels: Hydrobatidae

LEACH'S PETREL, *Oceanodroma leucorhoa* (Vieillot)

SPECIES ACCOUNT

Also known as Leach's Fork-tailed Petrel. This species and others of its family are called Mother Carey's Chickens by sailors and Storm(y) Petrels by both mariners and naturalists. A small, sooty brown pelagic bird with forked tail. Atlantic and n. Pacific birds have white patch on upper tail-coverts bisected vertically by grayish shafts of longer upper tail-covert feathers. However, when tail is folded patches merge to form one continuous band; only when tail is sufficiently spread—usually when bird is in the hand—is dark middle area visible. Compare carefully with Harcourt's (separation at sea practically impossible) and Wilson's petrels. Told from the latter by its slimmer lines; longer wings; black (not yellow-webbed) feet; forked (not square) tail; and broken (not continuous) patch on upper tail-coverts. From Harcourt's it is distinguished by its slightly more forked tail (ca. $\frac{3}{8}$ in. deeper) and bisected (not unbroken) patch on upper tail-coverts. Length, ca. 8 in.; wingspan, up to ca. 19; weight, $1\frac{1}{2}$ oz.

RANGE: On offshore islands in cold seas, in North Atlantic, from s. Labrador and Newfoundland to Nova Scotia and Massachusetts, also s. Iceland, and off n. Great Britain (St. Kilda, North Rona, Sula Sgeir, and Flannan islands); in North Pacific, from Commander and Aleutian islands and s.e. Alaska south along e. Asia and w. North America to Tropic of Cancer. Winters on temperate, subtropical, and tropical waters of Atlantic south to Cape region of Africa, but in Pacific stays north of Equator and frequents chiefly cool water.

TEXAS: *Accidental:* One record: Nueces-Kleberg cos., Padre Island Nat. Seashore, near Little Shell Beach (1 captured alive from surf, May 31, 1970, Mr. and Mrs. E. N. Herron; identified by Herrons on May 31, and verified June 1, 1970, by Kay McCracken and Emilie Payne). Good photographs were taken—some of which clearly show diagnostic Leach's characteristics, especially the nearly one-inch-deep fork in Barn Swallow-like tail (slide no. 7 in Texas Photo-Record File, Texas A&M University). Bird released in Nueces Co. at Gulf Beach Park, Padre Island, June 1, 1970.

HAUNTS AND HABITS: Small and dark, the storm petrels, which comprise Hydrobatidae, are swallowlike sea birds occurring on all oceans except the Arctic. Species

within this family number thirty-three according to Mayr and Amadon; eighteen fide Van Tyne and Berger. As is indicated by the figures of these noted ornithologists, storm petrel species are notoriously hard to separate from each other—they are all tiny, web-footed pelagic birds, each with a single, circular nostril tube on top of the bill; size, plumage pattern, and coloration are similar in most forms. Members of the Hydrobatidae do, however, sort themselves out into primarily cold-sea species versus warm-sea species; also some petrels habitually follow ships, others do not.

Leach's Petrel during the breeding season seeks cold-water oceans in regions of polar convergences where plankton is highly concentrated. In colonies, pairs nest in burrows on wooded, turfy, or boulder-strewn offshore islets. Each male excavates a tunnel about three or four feet deep, using his bill as a pick and kicking the soil out behind with his feet. Burrows are built in open fields, under branches or boulders, or amid tree roots. Working in shifts of about ninety-six hours without food, male and female take turns incubating the one egg. Pairs return to the same site year after year and remain mated as long as the nest is usable. This species, like most petrels, is almost entirely nocturnal in and about its nesting islands, but at sea where they feed, petrels fish mainly in daylight. During winter, Leach's disperses toward tropical seas, mainly near equatorial convergences.

Flight, even for a petrel, is exceedingly light, bounding, and erratic, with much changing of direction and gliding interspersed with rapid wing beating. On the wing, the Leach's is often said to resemble a nightjar or nighthawk. The petrel at times alights on the water but swims only briefly before it lifts off again. Apparently it does not patter or "dance" on the surface like the Wilson's and some other southern storm petrels. As a rule, the Leach's does not follow ships, although it can be baited if oily, greasy scraps are tossed overboard. Food is obtained largely from plankton and wastes of whales and seals, which the Leach's trails; fish, small crustaceans, and mollusks are also taken.

Kay McCracken and Emilie Payne, central coast naturalists, are so far the only ones to give an account of the plumage and flight of a Leach's Petrel in Texas. After handling the bird found near Corpus Christi, Mrs. McCracken described its feathering as silky but even softer. In a letter dated September 23, 1971, she wrote: "After examining and photographing the petrel, Emilie Payne and I took it to Gulf Beach Park on

Padre Island [Nueces Co.] and released it. The petrel first circled inland, toward the setting sun, then circled back over the surf, flying strong and well [behavior suggested bird was getting navigational bearings]. It was just a dot over the Gulf at 8:00 P.M. Whether the flight was typically 'erratic' as described for this species we cannot say, having seen no other petrel for comparison."

During night flights about the nesting islets, Leach's Petrels stutter many variations of a rapid, guttural, ticking *kock koch-koch-koch-koch-pitter-r-r-r-r-al*. Birds at sea have been heard uttering this call. A high-pitched, sweet crooning issues from the nest burrows.

NOTE: Photographs of the one Leach's found in Texas appeared to the senior editor, et al., to represent the Atlantic race, *O. l. leucorhoa*, but subspecies cannot ordinarily be certified from photographs; hence there follows no detailed account. For description and measurements, see Palmer, 1962, *Handbook of North American Birds*, vol. 1, pp. 225-226; also Witherby, et al., 1947, *Handbook of British Birds*, vol. 4, p. 32.

HARCOURT'S PETREL, *Oceanodroma castro* (Harcourt)

SPECIES ACCOUNT

Band-rumped Petrel, Madeira Petrel, and Madeiran Fork-tailed Petrel (British) of various authors. A small pelagic bird; sooty brown with white band on upper tail-coverts (commonly called "rump"). Practically impossible to separate at sea from Leach's Petrel (especially the white-rumped individuals in the Atlantic and n. Pacific). Identification—best noted if bird is in the hand—is based on the somewhat less forked tail (fork $\frac{1}{2}$ in. or less versus $\frac{3}{4}$ in. or slightly more in Leach's) and the unbroken (not bisected vertically) white upper tail-coverts. Diagnostic for Harcourt's are the black tips on its white upper tail-covert feathers. Length, 9 in.; wingspan, 18.

RANGE: Oceanic islands on periphery of tropical waters. In the Atlantic: Azores, Madeira, Salvages, Cape Verde, St. Helena, and Ascension islands; in the Pacific: Japan (Hidejima), Hawaii, Cocos (possibly), and Galápagos islands. Wanders widely during non-breeding season over warm seas.

TEXAS: *Casual*: Five records: Kleberg Co., n. Padre Island (1 found dead on beach, July 24, 1968, H. H. Hildebrand, Texas A&I University collection, no. 299); Kleberg Co., 15½ mi. south of Nueces Co. Park (ill and molting female collected, June 3, 1969, Bill Causey; specimen in Welder Wildlife Refuge collection, identified by Roxie C. Laybourne and J. W. Aldrich); Kleberg-Kenedy co. line, Los Olmos Creek (1 studied carefully at extremely close range, May 30, 1965, E. B. Kincaid, Jr.); Hidalgo Co., Edinburg (3 found exhausted after Hurricane Alice, June 25, 1954, Jesus Ochoa; 1, sex undetermined, preserved as mummy, Texas A&M University collection, no. 6358, identified

by R. C. Murphy); Comal Co., New Braunfels (1 found after torrential rains, June 25, 1960, Sonny House; photo of bird appeared in *New Braunfels Herald*, June 28, 1960).

HAUNTS AND HABITS: Harcourt's Petrel is the warm-water version of the Leach's; neither species makes a habit of following ships. Rocky or turfy oceanic islands scattered on the margins of the tropical Atlantic and Pacific are nesting bases for *Oceanodroma castro*. The two peak breeding periods are from June to September and October to January; eggs have been collected in every month except May and July. Nest burrows, which the birds excavate, generally twist and turn in the ground to a depth of one to three feet. Occasionally pairs nest in natural crevices. Nonbreeders disperse to subtropical waters surrounding their breeding grounds; there appears to be no formal migration. Much remains unknown about the extent of the Harcourt's wanderings. Individuals at sea are usually encountered singly.

Flight of the Harcourt's, an important aid in field identification, is generally intermediate between that of the Storm Petrel, *Hydrobates pelagicus*, and the Leach's: Harcourt's flutters less than the Storm and executes fewer leaps and bounds than the Leach's. It also does not skim or "dance" on the water as habitually as does the Wilson's. Diet of the present species has not been studied.

E. B. Kincaid, Jr., appears to be the only one who has observed any behavior—other than dying—of Harcourt's Petrel in the Lone Star State. The one individual he saw was buoyantly floating, with tail well clear of the water but not cocked, on warm and salty Los Olmos Creek, which marks the boundary between the central and lower coasts. The bird faced toward Baffin Bay, one-half mile distant. It seemed tired but otherwise healthy. As Kincaid waded toward the petrel, it did not flush until almost in his hand; the bird lightly fluttered into the air without pattering along the water. Flight, in part over mesquite bushes, was low with no glidings; it was similar to that of nearby night-hawks but with fewer bounds and erratic changes of direction. In its proper marine habitat the petrel probably would have glided some on sea breezes; also, this undoubtedly partly starved individual would likely have shown somewhat more bounce in its flight under normal conditions.

The noise made by a wet finger rubbed on glass describes the four- or five-note squeak of the Harcourt's Petrel; sometimes this concludes with a purring *urrrr*. It is sounded in the burrow or in nocturnal aerial displays above the nesting areas.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN HARCOURT'S PETREL, *Oceanodroma castro* *castro* (Harcourt)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Pileum and nape blackish mouse gray; back and scapulars similar but somewhat brownish; rump same or more blackish; upper tail-coverts white with broad black tips;

rectrices brownish black and, except for middle feathers, broadly white at base; sides of head and of neck, with lower parts, fuscous black, but chin chaetura drab to hair brown; outer lower tail-coverts with white outer webs, and all with white bases, also flanks with large white area; primaries and outer secondaries brownish black, but inner webs, except at tips, fuscous; inner secondaries fuscous, with narrow pale edgings on outer webs and on some of their tips; lesser upper wing-coverts like back, remainder fuscous, axillars like breast; lining of wing fuscous black to fuscous. Bill, legs, and feet black; iris blackish brown. *Adults, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adults. *Second winter*: Acquired by complete molt from first nuptial. Like adults in winter. *First nuptial*: Acquired by wear from first winter. Similar to nuptial adults but paler and more brownish above and below. *First winter* (juvenal plumage of most authors): Acquired by complete molt from juvenal (second down). Like first nuptial.

MEASUREMENTS: See Palmer, 1962, *Handbook of North American Birds*, vol. 1, p. 236; also Witherby, et al., 1947, *Handbook of British Birds*, vol. 4, p. 34.

RANGE: Azores, Madeira, Salvages, Cape Verde, St. Helena, and Ascension islands. Probably wanders widely over subtropical and, to a lesser extent, tropical waters during nonbreeding season; recorded on Canary Islands and off coast of Brazil.

TEXAS: *Casual*: Three specimens (see species account).

WILSON'S PETREL, *Oceanites oceanicus* (Kuhl)

SPECIES ACCOUNT

A very small, sooty brown pelagic bird with rather short, rounded wings; square or slightly rounded tail; white upper tail-coverts ("rump"); long black legs with yellow-webbed feet. Has swallowlike flight; frequently patters feet on water. Compare carefully with Leach's and Harcourt's petrels. Length, 7¼ in.; wing-span, 16¼; weight, ca. 1¼ oz.

RANGE: Circumpolar on coast of Antarctica and on subantarctic islands offshore from South America and in s. Indian Ocean. In winter (summer in Northern Hemisphere) wanders widely over and on the world's oceans; in the Pacific, seldom north of Tropic of Capricorn; in the Atlantic, north to about lat. 50° N., a few into the Mediterranean and Gulf of Mexico.

TEXAS: *Casual*: Two records: Jefferson Co., 7 mi. off Texas Point, near Sabine Pass (1 seen, Apr. 20, 1961, L. E. Williams, Jr.); Harris Co., at mouth of Fish Bayou, San Jacinto Bay (1 shot, June 5, 1912, fide G. F. Simmons).

HAUNTS AND HABITS: The Wilson's Petrel, perhaps the most abundant bird species in the world, nests in hordes on barren rocky coasts of Antarctica, and probably many of its offshore islets, from December to April. Nests are cavities and crevices under rocks or burrows built by the birds; here male and female work in approximately forty-eight-hour shifts to incubate the one egg. Recoveries of banded birds show individuals resort to the same burrow season after season. During its winter (our summer), the Wilson's disperses northward almost throughout the Atlantic and Indian oceans; in the Pacific, however, birds wander over temperate waters mainly south of Tropic of Capricorn. Concentrations of *Oceanites oceanicus* occur chiefly where cool and tropical waters converge, since this

situation stimulates high densities of plankton food. Off the breeding grounds, the Wilson's is seen singly, in small parties, or less frequently in large groups at feeding areas.

The fluttery wing-beats of this petrel are interspersed with short glides. With wings level or barely raised, bill angled down, legs dangling forward, and tail fanned, the Wilson's hops or dances over the water, its feet breaking the surface as the bird skips along. When and if it settles on the water, it floats buoyantly, and, although it can dive, it seldom does. On the ground, individuals at times dash about rapidly and stand upright for brief periods. Krill (*Euphausia superba*) is probably the chief source of food, supplemented with amphipods, small cephalopods, tiny fish, and bits of algae. In Antarctica, the Wilson's has been seen snatching insects high in the air like a martin. These petrels consistently flit about whaling and fishing vessels, here picking up offal and fatty scraps. They also dance in the wake of any type of ship, where they glean tiny marine animals stirred up by the propeller and eat bacon fat and other grease thrown out of the galley.

At sea, Wilson's Petrels are silent except for faint peepings, which issue especially rapidly when birds are feeding. In and about the nest burrows at night, they peep, chatter, chuckle, twitter, and coo.

DETAILED ACCOUNT: ONE SUBSPECIES

ATLANTIC WILSON'S PETREL, *Oceanites oceanicus oceanicus* (Kuhl)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Upper parts fuscous black or chaetura black; outer edges of greater wing-coverts hair brown; upper tail-coverts pure white; lower surface, including lining of wing, chaetura drab or fuscous; edge of wing below with slightly paler feather margins. Bill, legs, and feet black, but webs of toes black with broad yellow ocher or orange oblong area; iris prout brown. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but less worn and often somewhat darker. *First nuptial*: Acquired by wear from first winter. Similar to nuptial adults, but feathers of abdomen with white edgings; lores with white spots; plumage worn and even frayed; greater wing-coverts paler. *First winter*: Acquired by wear from juvenal. Similar to first nuptial, but white edgings on feathers of abdomen broader; plumage less faded, bleached, or worn. Practically identical with juvenal. *Juvenal* (apparently no second down plumage): Acquired by complete postnatal molt. Similar to adults in winter, but with conspicuous white edgings on feathers of abdomen; whitish spot in front of eye.

MEASUREMENTS: *Adult male*: Wing, 136.9–151.9 (average, 144.8) mm.; tail, 61.5–71.9 (68.1); bill (exposed culmen), 10.9–13.0 (12.2); height of bill at base, 5.1–6.1 (5.6); tarsus, 32.0–35.1 (33.8); middle toe without claw, 22.1–23.6 (22.6). *Adult female*: Wing, 145.0–159.0 (151.1); tail, 67.1–77.0 (73.4); bill, 10.9–12.7 (11.7); height of bill, 5.1–6.1 (5.6); tarsus, 33.0–36.6 (34.8); middle toe, 22.1–24.9 (23.1).

RANGE: Locally in s. South Atlantic from South Georgia Island to South Orkney Islands, South Shetland Islands, Adelie Land, and Victoria Land, also on Kerguelen Island in s. Indian Ocean. Wanders north in Atlantic during nonbreeding season to approximately lat. 50° N.; a few into the Mediterranean and Gulf of Mexico.

TEXAS: *Casual*: The bird shot in Harris Co., but apparently not preserved as a specimen, was very likely of this race (see species account).

[Tropicbirds: Phaethontidae

WHITE-TAILED TROPICBIRD, *Leptophaëthon lepturus* (Daudin)

Phaëthon lepturus of A.O.U. check-list, 1957. Also known as Yellow-billed Tropicbird; Boatswain Bird of mariners. A ternlike pelagic bird with two long (18 in.) central tail feathers ("streamers"); reddish orange bill (yellow in immature). *Adult*: mostly white with black stroke on face through and behind eye; dorsal surface of spread wing shows black on five outermost primaries, and a narrow black stripe on wing-coverts contiguous and at right angles with black rear scapulars and tertials. *Immature*: lacks tail streamers; has fine black barring on crown, hindneck, back, and wing-coverts (in place of unbroken stripe). Length (including streamers), 26 in.; wingspan, 34; weight, 14½ oz.

RANGE: Hawaiian Islands, Bermuda, and Bahamas, and many other islands in Pacific, Atlantic, and Indian oceans mostly between Tropic of Cancer and Tropic of Capricorn. In winter largely withdraws from northernmost Atlantic (Bermuda, Bahamas, Greater Antilles). Pelagic, wandering widely, during nonbreeding season; occurs regularly in Sargasso Sea.

TEXAS: Hypothetical: At least ten sightings on upper and central coasts, none substantiated by photographs: Jefferson Co., near Sabine (1 seen, Dec. 31, 1929, Bessie Reid); Chambers Co., Cove (1 seen, July 27, 1935, A. K. McKay); Harris Co., Morgan's Point (1 seen, May 20, 1960, Linda Snyder); Galveston Co. (Galveston Island, Nov. 15, 1957, C. E. Hall; Texas City Dike, 1 immature, Mar. 26, 1963, L. Snyder; 2½ mi. east-southeast of Galveston, 2 adults, Nov. 12, 1966, B. P. Brown, Jr., Mr. and Mrs. B. P. Brown, Sr.); Brazoria Co., 14 mi. east of Angleton (1 observed, June 30, 1967, Royce Jurries); Calhoun Co., s.w. Matagorda Is-

land (1 adult, Aug. 6, 7, 1937, Bernard Bartnick); Aransas Co. (Fulton, 1 adult, Aug. 8, 1936, B. Bartnick; Ayres' Dugout, 2 seen together, June 30, 1945, Connie Hagar and R. O'Reilly).

HAUNTS AND HABITS: The three tropicbird species, Phaethontidae, are well named. Even more than coconut palms and trade winds they belong to tropical oceans. Their family name comes from the son of Helios, Phaëthon, a shining one of classical mythology who streaked cometlike from the far sky into the sea. The plumages of tropicbirds are shiny like silk or satin, and their feathers are often suffused with pink as in a seascape at sunrise, the birds' preferred fishing time. Tropicbirds nest on oceanic islands. Between breeding seasons they fly over even the most distant stretches of blue ocean, frequently hundreds of miles from the nearest land. At all times they avoid continental coasts and associated murky water. The birds' plunges from the air for prey, chiefly squid, require clear water for clear sighting. The many big Texas rivers—such as the Sabine, Trinity, Brazos, Colorado, Nueces, and Rio Grande—which empty into the Gulf of Mexico have always kept coastal waters heavy with silt and sand. In late years, agricultural and industrial pollution has added to the murk. In short, Texas is unsuited to the White-tailed Tropicbird and its cousins. Beachcombers could perform a great service for the ornithological record if they would salvage the skull, wings, tail, or any other part of a tropicbird corpse that might wash in with Gulf surf. Natural history museums or wildlife study collections would be delighted to have these relics. The senior editor can testify that the White-tailed Tropicbird without its full-length tail streamers (many individuals are in this condition) appears very much like a Royal Tern. In conclusion, a Texas specimen or photograph of a tropicbird is much needed.]

Pelicans: Pelecanidae

WHITE PELICAN, *Cyrtopelicanus erythrorhynchos* (Gmelin)

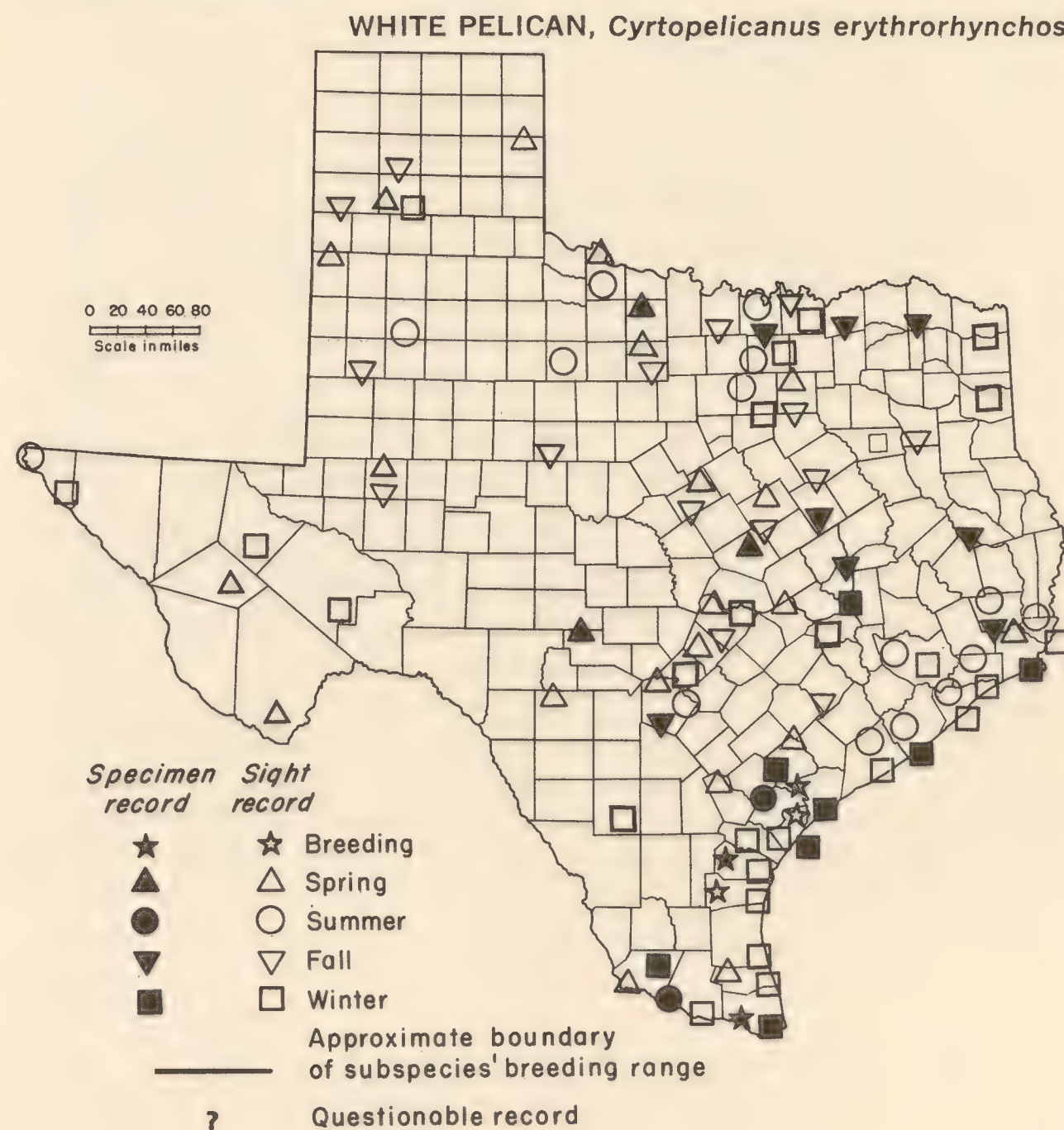
SPECIES ACCOUNT

Pelecanus erythrorhynchos of A.O.U. check-list, 1957 (see Appendix A). American White Pelican and Rough-billed Pelican of numerous authors and zoos. A very large, ample-bodied, white water bird with fairly long neck; big orangish throat pouch attached to long orangish beak (breeding individuals acquire erect fibrous plate on upper mandible); orange to orange-red legs and feet. In flight, draws head back between shoulders; reveals black primaries and outer secondaries. Length, 61¾ in.; wingspan, 8¾ ft.; weight, 15¾ lbs.

RANGE: N. Alberta, n. Saskatchewan, and c. Manitoba, south locally to c. Washington, s. California, w. Nevada, n. Utah, n. Colorado, s.e. Wyoming, and n.e. South Dakota; also very locally on Texas and Tamaulipas coast. Winters from Central Valley of California and c. Arizona, and from s. Texas to Florida, south on coasts of Baja California and mainland Mexico to Guatemala.

TEXAS: (See map.) *Breeding:* Late Apr. to Aug. (eggs, May 3 to July 14) from near sea level to about 57 ft. Locally common to uncommon in a few scattered colonies on central coast islands (South [Big] Bird Island, Kleberg Co., only regular recent colony); has bred, Calhoun, Aransas, Nueces, and Cameron cos. Non-breeding summer lingerers are irregularly fairly common to scarce along entire coast, rare elsewhere over state. *Migration:* Early Apr. to early June; late Aug. to mid-Nov. (extremes: Mar. 23, June 23; July 25, Nov. 24). Irregularly very common, formerly abundant, to uncommon over eastern half west to Gainesville, Fort Worth, Waco, Austin, San Antonio, and McAllen; scarce to rare in western half. *Winter:* Nov. through Mar. Locally very common (but declining) to uncommon along coast; irregularly scarce to rare elsewhere over eastern half. Casual in Starr Co., Rio Grande City (collected, ca. Dec. 8, 1935, G. B. Fleming; 16 seen, Dec. 28, 1949, L. I. Davis), Pecos Co. (fide Anne LeSassier), Reeves Co., Lake Balmorhea (2 seen, Jan. 1, 1968, A. LeSassier, et al.; 1 seen, Nov. 25, 1971, G. F. Oatman, Jr., Rose Ann Rowlett), and El Paso Co., Lake Ascarate (1 seen, Dec. 29, 1953, El Paso Audubon Society).

HAUNTS AND HABITS: Pelicans are large stocky water birds with enormous throat pouches that fold under their long, straight, hook-tipped beaks; the four toes of each foot are connected by a web, as in all Pelicaniformes. These birds, considering their bulk and awkwardness on land, are remarkably graceful on the wing. On water, they float high and their large feet propel them powerfully. The six members of Pelecanidae, two of which are New World species, range tropical and temperate zones. Texas, and probably all the United States, will soon be reduced to one Western Hemisphere pelican, if the Brown Pelican's decline continues at its present pace. The White Pelican's status is somewhat healthier but nonetheless potentially precarious. For nesting it requires islands in permanent water—chiefly large freshwater lakes—remote from man. In Texas, however, shallow coastal bays and islets provide breeding haunts for the species. Terrain must be flat or slightly sloping with little obstructing vegetation. At about three or four weeks of age, young pelicans gather for several weeks in groups called pods. Prior to formal migration, many of these young-of-the-year wander, usually northward, from the breeding



areas. Transients, often passing over deserts and high mountains, fly chiefly to coasts in winter. Pelicans are gregarious at all seasons.

The great White Pelican is an exceptionally strong flier. It is the largest soaring bird commonly found in Texas, with a wingspan attaining 9½ feet in large individuals. In flight, the head is drawn back and the beak rests on the pelican's round chest. Flapping, then gliding, birds move usually in long lines or V-formations; flocks fly low over the water, somewhat higher over land. Standard flight speed is 30 m.p.h. Soaring high in the air is a frequent pastime of pelicans, especially in anticipation of migration or prior to the afternoon foraging. A large flock of White Pelicans circling on a thermal in blue sky is a natural spectacle that is unexcelled in America.

The White Pelican never dives for its prey as does the Brown; neither species flies with fish in the pouch. Swimming buoyantly on water, a feeding White Pelican immerses its head and scoops up a fish in its pouch; water is then squeezed out, head lifted, and the catch swallowed. In deep water, White Pelicans generally feed alone. In shallows, a team—often arranged in a line or semicircle—swims toward the shore with much splashing of feet and wings, forcing fish to concentrate in very shallow water. When the fish-herding pelicans almost reach the bank, cooperation ceases and each bird scoops up as many fish as it can eat. The diet is largely rough fish, such as carp (*Cyprinus*), chub (*Siphateles*), catfish (*Ameiurus*), suckers (*Catostomus* and *Chasmistes*), minnows (*Leucichthys*), stickleback (*Eucalia*), and jackfish (*Esox*); an occasional salamander or crayfish is taken. Between early morning and late afternoon feedings, birds rest together along beaches and sandbars; during the breeding season, much food gathering is done at night. White Pelicans do not perch in trees. At night they roost on the ground near water. They waddle clumsily on land.

As a rule, the White Pelican is silent. Adults on the nesting grounds croak or grunt feebly at times; young birds cough or sound a whining grunt.

CHANGES: The White Pelican is remarkable for its comparative lack of change in status and distribution. In most years during the twentieth century there has been only one nesting colony in Texas, usually on North Bird Island or South Bird Island, both in Kleberg County. This pelicanry is 1,400 miles from its nearest regular U.S. neighbor (in Utah). However, at least in 1969 and 1970, there were White Pelicans nesting on two islands south of the Rio Grande delta in the Laguna Madre de Tamaulipas. Ordinarily when times get hard for a bird species, it is the nesting stations at or near the extremities of the range that are the first to go. That White Pelican breeding in Texas has held up fairly well is illustrated by the following list of historic and contemporary nesting sites:

Central coast: Bird Island in San Antonio Bay, Calhoun Co. ("nesting," May 23, 1925, A. J. Kirn); island in Mesquite Bay, Aransas-Calhoun co. line (1 nesting

pair, June, 1933, Bessie M. Reid); island in Oso Bay, Nueces Co. (72 birds reported and 11 nests, some with eggs, June 21, 1935, Louis Rawalt); North (Little) Bird Island, Kleberg Co. (eggs taken, May 28, 1910, B. A. Curry, C. E. Farley; eggs taken, May 20, 1917, May 12, 18, 19, 1919, R. W. Quillin; eggs taken, May 12, 15, 1919, H. W. Brandt; nests with eggs or young, May 23, 1920, T. G. Pearson; several hundred nests with eggs and young, June 9, 1929, J. J. Carroll; nests with eggs and young, May 25, 1930, Carroll); South (Big) Bird Island, Kleberg Co. (many nests, May 14, 1927, Carroll; nearly 200 nests found, probably 150 pairs breeding, May 14, 1928, Carroll; 1,500 nests with eggs and 100 more building, May 13, 1941, Alexander Sprunt, Jr.; 420 pairs, summer 1959, Alexander Sprunt IV; 450 young fledged, summer 1968, Louis Rawalt; 200 breeding pairs and 100 young, May 28, and June 3, 1969, fide H. H. Hildebrand, G. W. Blacklock; 126 young counted, June 3, 1970, Blacklock, fewer than 100 fledged in 1971, Blacklock).

Lower coast: All located in Cameron Co.: near Brownsville (set of 1 egg taken, May 28, 1907); island in a lagoon along coast (eggs taken, May 3, 1927, R. D. Camp); island in Bahia Grande (colony of 200 nests, May 18, 1934, young noted in nests, June 12, 1934, nests and eggs recorded, July 14, 1934, H. C. Blanchard).

In May and June of 1969, the Cooperative Fish-eating Bird Survey found White Pelicans in the number of 694 on the Texas upper coast, 1,570 on the central coast, and 380 on the lower coast. (This annual survey, begun in 1967, is sponsored by Corpus Christi Outdoor Club, Del Mar College, Houston Audubon Society, Marine Science Institute of the University of Texas, Museum of Natural Science of Houston, Texas A&I University, Texas Parks and Wildlife Department, University of Corpus Christi, U.S. Fish and Wildlife Service, and Welder Wildlife Foundation. Compilers of the census are G. W. Blacklock and H. H. Hildebrand.)

From the foregoing figures it can be seen that the White Pelican, unlike the Brown, did not collapse in the Lone Star State between 1958 and 1961. This fact is a major, perhaps *the* major, mystery of Texas ornithology. Both species incubate by wrapping their totipalmate feet around their eggs; either of these heavy birds is likely to break pesticide-thinned eggs when suddenly frightened from the nest. The two pelicans both eat poison-tainted fish in the same bays—or do they? Detailed studies of the White Pelican's diet, all of them made outside of Texas, show the species eating only freshwater fish. South (Big) Bird Island—sole regular nesting site of *C. erythrorhynchos*—is within daily cruising range of numerous fish-stocked cattle tanks on the nearly one-million-acre King Ranch. To protect the ranch's valuable Santa Gertrudis cattle these watering lakes are off-limits to both crop-dusting planes and polluting industrial plants. The theory—that White Pelicans save themselves by eating pure fish far from contaminated

coastal waters—may have validity, especially in view of the fact that White Pelicans nest on an island in Great Salt Lake (too salty for fish life) and, of necessity, do all their fishing many miles away in fresh water. However, breeding colonies of the White Pelican have recently been discovered in Laguna Madre de Tamaulipas, Mexico; there were some one thousand individuals nesting here in 1970. The two Mexican breeding islands are adjacent to a portion of Tamaulipas which has been subject to very heavy dosages of DDT and other pesticides sprayed on cotton since World War II.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Decomposed occipital plumes (about 3 in. long), narrow pointed plumelike feathers of jugulum, and anterior lesser wing-coverts cream buff; primaries, also outer and terminal parts of middle secondaries chaetura black, middle secondaries broadly margined with white; remainder of plumage pure white, unmarked. Bill orange or salmon, culmen yellow; gular pouch dull white or yellow, base anteriorly changing to red; horny semicircular maxillary crest light orange with somewhat quadrate black spot; bare skin of lores and orbital region deep yellow; eyelids dull red; iris white; legs and feet orange to orange-red. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but without horny crest on maxilla; all plumes reduced or absent; entire plumage white. Bill, pouch, legs, and feet yellow; iris bluish gray. *Third nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but decomposed occipital plumes usually white or very pale buff, middle of occiput more or less hair brown. *Third winter:* Acquired by complete postnuptial molt. Similar to adults in winter. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but decomposed plumes of occiput very short and white; center of occiput and feathers along middle of upper hindneck hair brown or drab. *Second winter:* Acquired by complete postnuptial molt. Similar to adults in winter, but decomposed plumes on occiput very much shorter. *First nuptial:* Acquired by wear from first winter. Similar to second nuptial, but head and breast white, without any material buff tinge; only very short occipital plumelike feathers, and no crest on culmen. Bill vinaceous buff, most of culmen pinkish orange buff, nail orange ochraceous; gular sac orange; legs and feet cadmium yellow, but claws partly blackish slate; plumage practically identical with first winter. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Primaries slate color, all but inner secondaries fuscous black; lesser wing-coverts drab or light hair brown, with white tips and edgings; remainder of plumage white; decomposed plumes on occiput very short. Bill, pouch, and feet less brightly colored than in adult; iris brown. *Juvenal* (natal down of most authors): Acquired by postnatal growth. Pure white, downy. *Natal:* None. Naked skin bright flesh color. Bill and pouch grayish white; iris white; feet pale yellowish.

MEASUREMENTS: *Adult male:* Wing, 540.0–640.1 (average, 588.2) mm.; tail, 145.5–165.1 (153.7); bill (exposed culmen), 287.0–371.1 (328.2); height of bill at base, 36.1–46.0 (40.9); tarsus, 116.6–137.4 (124.5); middle toe without claw, 95.0–115.1 (106.7). *Adult female:* Wing, 541.0–590.0 (557.8); tail, 137.9–145.0 (142.2); bill, 279.9–326.9 (297.9); height of bill, 36.6–43.9 (40.1); tarsus, 110.0–125.0 (117.3); middle toe, 97.1–107.4 (101.9).

TEXAS: *Breeding:* Collected in Kleberg and Cameron (formerly) cos. *Migration:* Collected north to Archer and Red River, east to Angelina and Hardin, south to Cameron, west to Kerr cos. *Winter:* Taken along and near coast northeast to Jefferson, southwest to Calhoun, Cameron, and Starr cos.

NESTING: *Nest:* Usually on islands in lakes—bays in Texas; on

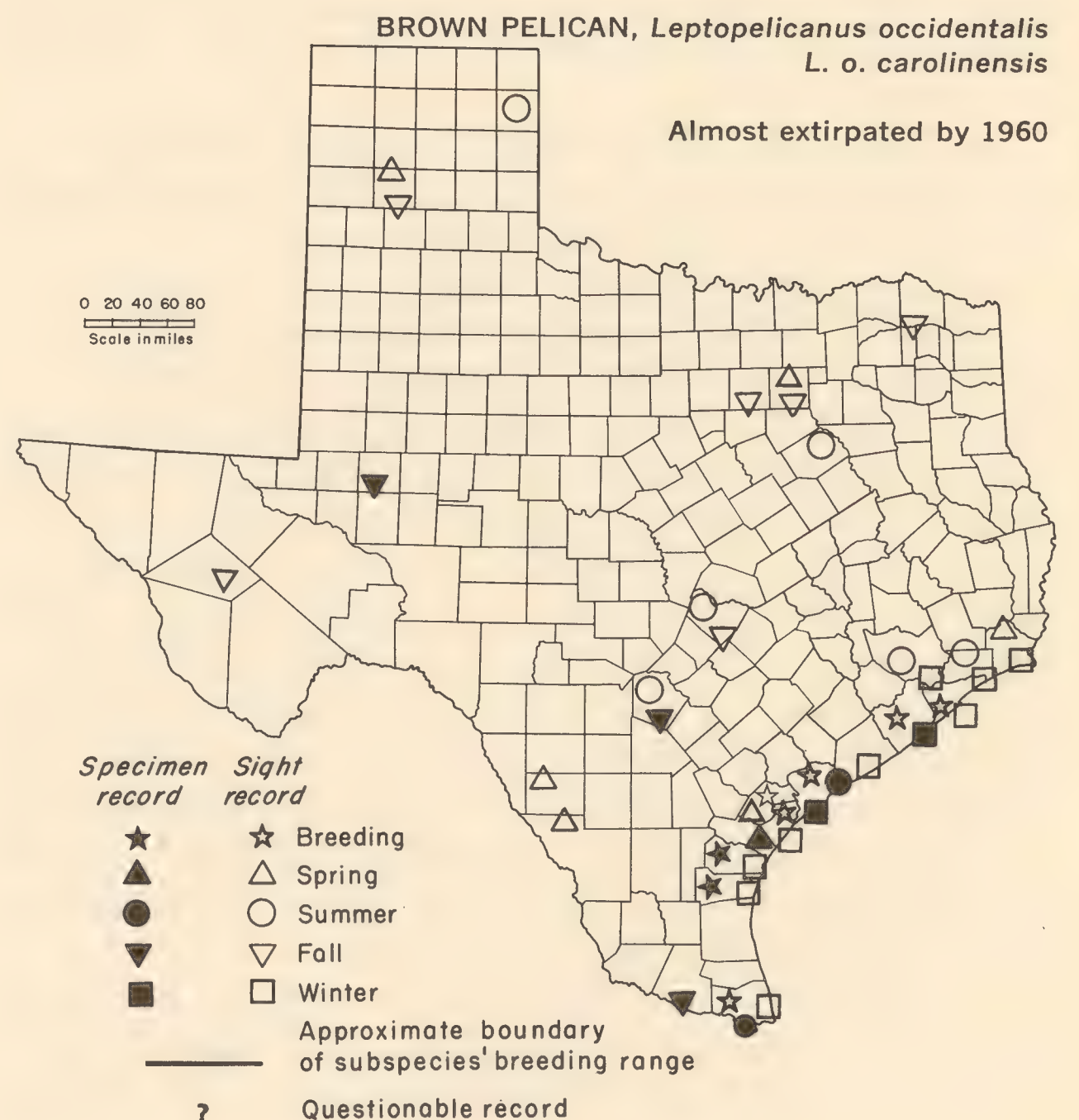
ground or on reed beds; ordinarily mere depression in sand or mud, composed of sticks, reeds, grass, plant stems, and other similar materials; lined with finer materials of same kind and with feathers. *Eggs:* 1–6, usually 2; ovate to elongate ovate or nearly elliptical oval; dull chalky white; unmarked, but often stained or soiled; average size, 89.9 × 56.4 mm.

BROWN PELICAN, *Leptopelicanus occidentalis* (Linnaeus)

SPECIES ACCOUNT

Pelecanus occidentalis of A.O.U. check-list, 1957 (see Appendix A). A large dark water bird with fairly long neck; long, hooked grayish bill; big olive or blackish throat pouch. *Adult:* white head and neck, partly washed with yellow; essentially silvery grayish on most of upper parts; brownish black on breast and belly; in nuptial dress, acquires rich chestnut feathering on neck from crest to upper back (crown and narrow lateral stripe on side of neck remain white). *Immature:* grayish brown above, including head and neck; dull white below. Length, 48 in.; wingspan, 6½ ft.; weight, 7½ lbs.

RANGE: On seacoasts and coastal islands, in the Pacific from c. California and in the Atlantic from Carolinas, Florida, and Texas (species much reduced in United States, with nesting exceedingly token during 1971, except in Florida stronghold), south to Baja California, both coasts of mainland Mexico and Central America, and extreme n. and most of w. South America (Venezuela to Peru and c. Chile); also Galápagos Islands, Bahamas, and West Indies. Individuals, largely immatures, wander during postbreeding season.



TEXAS: (See map.) *Resident* (practically extirpated): Breeds, Feb. to July (eggs, Mar. 28 to July 1) very near sea level. Formerly locally very common, verging on abundant, to uncommon in islet colonies along coast from Galveston to Port Isabel. Beginning about 1950, a precipitous decline, which reached catastrophic proportions by 1958, reduced the Texas population to present (1972) status: extirpated as nester on upper and lower coasts; locally uncommon to rare on central coast. Only reports of nesting, 1960 through 1971: Calhoun-Aransas co. line, Second Chain-of-Islands (11 seen, 2 pairs nested unsuccessfully, summer 1965, Alexander Sprunt IV; 2 nests found, each with 3 eggs—1 young fledged from one nest and 3 young from the other, summer 1968, G. M. Stricklin; nests and eggs abandoned, late in May, 1970, H. H. Hildebrand); Nueces Co., Pelican Island in Corpus Christi Bay (9 young fledged from 5 nests, summer 1970, Emilie Payne; total of 7 eggs in 3 nests, of which 3 young fledged, summer 1971, photographed by E. Payne and Earl Roper). *Dispersal*: Rare on coast; casual in all other major regions of state. Only inland records since 1950: Jeff Davis Co., Roosevelt Lake (seen, Oct., 1955, J. A. Roosevelt, fide Pansy Espy); Randall Co. (Buffalo Lake, seen, ca. Oct. 1, 1955, W. Pond; Canyon, 1 seen, Apr. 26, 1956, J. H. Bailey); Hemphill Co. (June, 1955, H. F. Saunders); Dallas Co., Dallas (an astounding 24 seen, Apr. 13, 1963, Rosabel Harris, Geth Osburn).

HAUNTS AND HABITS: The picturesque Brown Pelican on its U.S. range soon may be only a memory in the minds of ancient bird watchers. Mainly a resident bird of subtropical and tropical seacoasts, it rarely strays far seaward, or inland, from its preferred saltwater shores. The only remote colony, and probably one of the species' last stands, is the Galápagos Islands, six hundred miles off South America in the Pacific. Cryptic postbreeding dispersals are indulged in but are unpredictable in time, duration, and direction. Superficially, the Brown Pelican seemed more or less to co-exist with man, but in the last two decades in Texas, as elsewhere in the United States, insults have become so great that it has suffered what appears to be an irreversible collapse.

Brown Pelicans fly with strong but slow flaps (about $1\frac{1}{2}$ per second) and measured glides, usually in single file; often they move so close to the water that wing-tips almost touch the surface. Flight speed varies from fourteen to thirty-five miles per hour. Usually from twenty-five to thirty feet in the air, individuals make spectacular crashing dives to catch fish. The birds are protected from injury by a cushion of air cells beneath the body skin. When prey is spied (water for obvious reasons must be reasonably clear), the Brown Pelican plunges vertically, head first and with wings partially folded; the wings are drawn far back just before impact with the water. Dives, as a rule, are made downwind, but the bird emerges upwind. To eat, while still afloat, it holds the beak downward, forces out water, then lifts the head and gulps its prey. Just as the pelican is swallowing its catch, gulls (usually Laughing

Gulls in the Gulf of Mexico) try, often with success, to steal fish from between its mandibles. When finished eating, the pelican takes flight into the wind. Fish are carried in the gullet but never in the pouch. Most species eaten by the Brown Pelican are of little or no sporting value; they include menhaden (*Brevoortia*), pigfish (*Orthopristes*), pinfish (*Diplodus*), thread herring (*Opisthonema*), sheepshead (*Archosargus*), and mullet (*Mugil*); prawns are infrequently taken.

Aside from a rare grunt or croak, adult Brown Pelicans are silent. Chicks sound choking barks and, as they grow larger, rasping *kr-r-r*'s and piercing screams.

CHANGES: Ever since white fishermen came to the warmer parts of America, starting in 1492, they have regarded the Brown Pelican as a competitor. Actually, pelican guano has fertilized estuary, bay, and sea water, making more plankton grow, which in turn has resulted in more fish. Unfortunately, fishing people have been very slow to understand this fundamental biological fact. In spite of persecution, Texas nesting colonies were populous during the first half of the twentieth century. Following is a list of sizeable Brown Pelican rookeries, all of them strictly historic, that have been found in the Lone Star State:

Upper coast: Pelican Island in Galveston Bay, Galveston Co. ("nesting," 1855–1858, J. D. Mitchell); Bird Island in San Luis Pass, Brazoria Co. (235 nests, June 10, 1935, and 41 nests, June 17, 1936, Alexander Sprunt, Jr.); same island (300 nests with eggs, May 28, 1938, G. G. Williams).

Central coast: Pelican Island in Pass Cavallo, Calhoun Co. (20 to 30 pairs attempted to nest, but high tides destroyed all but 7 nests, late May, 1923, A. C. Bent); First Chain-of-Islands, Calhoun Co. ("formerly nested," fide J. D. Mitchell); Shell Island in San Antonio Bay, Calhoun Co. (200 birds, but not more than 25 or 30 nests, all of which apparently were second nests built to replace first destroyed by fishermen, May 2–3, 1928, J. J. Carroll); Ship Island, Calhoun Co. (nests with eggs, June 6, 1931, J. J. Carroll); Bird Island in San Antonio Bay, Calhoun Co. ("breeding by the thousands," Apr., 1905, G. E. Roberts, fide A. H. Howell); Belden Cut, Aransas Co. (breeding colony visited, May 15, 1931, and again, May 3, 1934, J. J. Carroll); Third Chain-of-Islands in w. Mesquite Bay, Aransas Co. (ca. 100 nests, all of which had been deserted; dead pelicans and heaps of destroyed eggs showed destruction result of attack by party of men, apparently fishermen, May 3, 1934, A. Sprunt, Jr.; nests with eggs and young found same place, June, 1935, Sprunt); Dunham Island, Aransas Co. (over 300 young in nests, May 26, 1920, T. G. Pearson); islands in Aransas Bay, Aransas Co. ("breeding," May 16, 1893, H. P. Attwater); Dimmit Island, Nueces Co. (1,000 birds formerly nested but egg and plume hunters drove them away, so that by 1900 not over 6 birds observed, Vernon Bailey); Spoil Banks, Nueces Co. (nests, June 13, 1939, R. P. Allen); Deadman Island near Corpus Christi Pass, Nueces Co. (2,000 found breeding, May 23, 1920, T. G. Pearson); Pelican Island in Corpus

Christi Bay, Nueces Co. (ca. 5,000 birds breeding, Mar. 30, 1878, G. B. Sennett); South (Big) Bird Island, Kleberg Co. (at least 700 pairs nesting, Apr., 1889, J. A. Singley); same island (eggs and young found, June 14, 15, 1909, J. M. Carroll); same island (1,000 or more pairs nesting, nests with eggs or young, May, 1919, H. W. Brandt); same island (hundreds nesting, many nests with eggs or young, June 17, 1926; colonies observed again, May 14, 1927; conditions little changed, May 4, 1928; slight increase in population noted, June 9, 1929, J. J. Carroll).

Lower coast: Mud dump near Port Isabel, Cameron Co. (a few birds beginning to nest, May 30, 1927; a few birds present again, but eggs not yet laid, May 28, 1928, J. J. Carroll); Brazos Santiago Pass, Cameron Co. (nests with eggs, May 30, 1927, J. J. Carroll).

Prejudice against the Brown Pelican was especially fierce during World War I (1914–1918). In 1918 denunciations of the species became extremely hysterical. Gulf state officials, “observers,” and newspaper reporters complained to the Federal Food Administration that there were 5,000,000 of these birds along the northern Gulf coast and that they were destroying the fishing industry. T. Gilbert Pearson, long-time president of the National Association of Audubon Societies, was appointed by the Federal Food Administration to make an actual count of Brown Pelicans and to determine what species of fish they were eating. This he did during June, 1918. Pearson’s method was to count two adult pelicans for each active nest he found along the entire U.S. Gulf coast; to the total nesting birds he then added 30 percent to cover the nonbreeders. Grand total for the Gulf of Mexico shore from the central coast of Texas to Cape Sable, Florida, was 65,000. Pearson estimated 5,000 Brown Pelicans on the Texas coast in 1918; in 1920, after another Texas census, he stated that his previous figure was “a liberal one.” During 1918, Pearson and his assistants, under the watchful eyes of state representatives, gathered fish (several thousand) which they saw young and old Brown Pelicans disgorge at nesting colony sites. These fish were shipped in tanks of formaldehyde to the U.S. Bureau of Fisheries in Washington, D.C. Fisheries experts there found that 100 percent of the fish collected in Texas and Louisiana were Gulf menhaden (*Brevoortia patronus*), a species too oily and bony for human consumption. Only 27 individuals out of 3,428 fish gathered in Florida colonies were of varieties at all eaten by American people; no important food fish were present. On the basis of these findings the U.S. government decided against destroying pelicans to preserve the wartime food fish industry. Needless to say, private individuals continued shooting pelicans and smashing their nests.

The next serious estimate of Brown Pelican numbers in the Lone Star State was made in 1939 by Robert P. Allen, National Audubon researcher on large water birds. He determined that there were about 1,000 nesting adults in the state. Allen’s idea was that there were “perhaps more than twice that many young.” Twice as

many young added to 1,000 nesters would total 3,000 pelicans in Texas in 1939. In 1950, using the same census method, Allen came up with 760 nesting Texas pelicans, which figures to 2,280 total birds.

There were no attempts to count all Texas Brown Pelicans in and around the big crash years of 1956–1961. However, the following Audubon Christmas Bird Counts, taken from *Audubon Field Notes* (now *American Birds*), reveal the population plunge:

Christmas Season	Texas Coast Counts	Brown Pelicans
1950	4	595
1951	4	482
1952	5	342
1953	5	431
1954	3	166
1955	5	289
1956	3	73
1957	5	86
1958	4	6
1959	4	6
1960	4	5
1961	4	1
1962	6	0
1963	7	0
1964	6	0
1965	7	8
1966	7	1
1967	7	0
1968	8	0
1969	8	1
1970	7	0
1971	9	5

In May and June of 1969, the Cooperative Fish-eating Bird Survey counted a total of 116 Brown Pelicans on the Texas coast (none on the upper coast, 88 on the central coast, and 28 on the lower coast).

In 1969 came news from California that pesticide-thinned Brown Pelican eggs were breaking by the hundreds. No such single cause of pelican vanishment has been uncovered in Texas—no massive nesting failures, no conspicuous numbers of birds sick or dead from poison or disease. Further, the Brown Pelican’s favorite menhaden still swim in millions, and fish are apparently still visible to fishing birds in coastal waters. In the Lone Star State, *L. occidentalis* has always had difficulty in maintaining its population. All Texas rookery islands are low; hence, if the wind gets even a little higher than normal, tides wash pelican eggs out of their nests. World War II (1939–1945) brought hordes of military and industrial people to the Texas coast, and with postwar affluence came an unprecedented boom in motor-driven pleasure boats. During the 1960’s, the senior editor made several trips through the Laguna Madre on the central and lower coast. Islands formerly of interest to nesting pelicans were trampled flat by sportsmen’s boots; most had weekend shacks and boat docks built on them. One exception to this dismal rule was South Bird Island in northern Laguna Madre. The National Audubon Society had placed large NO LANDING signs around the island. What with surveillance by Audubon wardens

and the island's moat of very shallow water covering "bottomless" gooey mud, South Bird appeared well protected. However, all nesting territories on the island were occupied by White Pelicans and other water birds; there seemed to be no room for Brown Pelicans. Even though the water of southern Laguna Madre is known by actual chemical tests to be a witch's brew of pesticides and defoliants (runoff mostly via the Arroyo Colorado from repeatedly poisoned cotton fields of the Rio Grande delta), the present editor believes the Brown Pelican would be in sad condition in Texas even if DDT had never been invented.

As Henry Gibson wrote, "It's not the same without pelicans." Environment in Texas and the world will never be anywhere near right unless the Brown Pelican is restored.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN BROWN PELICAN, *Leptopelicanus occidentalis carolinensis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum and anterior part of sides of head Naples yellow; short tuft on upper nape and hindneck chestnut or bay; mantle pale drab gray, feathers with fuscous black edgings which give a streaked appearance, this most conspicuous anteriorly; rump and upper tail-coverts broadly streaked with dull white and dull black; tail pale drab gray, shafts blackish; wings fuscous black, wing-coverts mostly pale drab gray, lesser wing-coverts conspicuously streaked with dull black and outer webs of secondaries clearer gray; broad white stripe connects with light yellow of sides of head and extends down side of pouch and neck; triangular area on throat below pouch chestnut or bay, below this a small subtriangular spot of Naples yellow, and jugulum, below this, fuscous black, remainder of lower parts fuscous, sides and jugulum conspicuously streaked with white, lower tail-coverts broadly white along shafts. Bill grayish white with irregular reddish spots, terminal portion brown or black, but nail often yellow; bare lores dark blue or slate black; eyelids pink or red; iris cream white; gular pouch greenish black or dark olive green; feet black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but no nape tuft; head and neck white; fore part of head and lower foreneck more or less extensively cream color; remainder of lower parts

chaetura black, many of feathers with median stripes and narrow tips of white or pale gray. Iris pale yellow or brown. *Third winter:* Acquired by complete postnuptial molt. Like adults in winter. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but upper parts darker and duller, light drab areas on mantle less extensive; pileum and hindneck mixed with spots of hair brown and drab; posterior lower parts lighter than in adults. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial, but with no brown on pileum and hindneck; abdomen more whitish. *First nuptial:* Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Top of head hair brown, with no yellow; hindneck drab; remainder of upper parts fuscous, mixed with dull drab gray; wings and tail fuscous, edges of quills and rectrices, also middle stripes of lesser wing-coverts largely pale brownish drab or drab gray; throat drab; remainder of under parts white; sides and flanks drab or hair brown, feathers streaked medially with dull white. Bill bluish gray, sometimes tinged yellow and with tip, including nail, blackish; gular sac dull grayish blue or blackish; iris brownish yellow or dark brown; bare space around eye dark dull bluish; legs, feet, and claws dull plumbeous. *Juvenal* (natal down of most authors): Acquired by postnatal growth. Pure white, downy. *Natal:* None. Young hatched naked, skin dull red color, later turning black.

MEASUREMENTS: *Adult male:* Wing, 508.0–555.0 (average, 525.0) mm.; tail, 130.0–152.9 (136.7); bill (exposed culmen), 301.0–338.1 (319.3); height of bill at base, 41.9–49.5 (45.7); tarsus, 78.0–85.1 (81.3); middle toe without claw, 104.1–107.4 (105.6). *Adult female:* Wing, 487.9–517.1 (500.1); tail, 125.0–134.1 (128.8); bill, 275.1–295.9 (286.5); height of bill, 39.1–39.9 (39.6); tarsus, 73.9–75.9 (75.2); middle toe, 97.1–102.1 (99.6).

RANGE: Locally on coasts from South Carolina, Florida, and Texas (numbers greatly reduced in United States during 1960's), south to Veracruz, Yucatán, and Panama.

TEXAS: *Resident* (practically extirpated): Has been collected along coast in Brazoria, Matagorda, Calhoun, Aransas, Nueces, Kleberg, and Cameron cos. *Dispersal:* Two specimens: Coke Co., Fort Chadbourne (1855, Dr. Swift); Bexar Co., Mitchell Lake (Nov. 15, 1931; Witte Memorial Museum collection). One killed (specimen?): Midland Co., Midland (Oct. 29, 1948, examined by J. E. Galley).

NESTING: *Nest:* On coastal islands or on edge of mainland; in bush, tree, or on ground; bulky and rather poorly constructed platform of grasses, sticks, weeds, leaves, straw, and similar materials; lined with weeds, often with green grasses. *Eggs:* 2–5, usually 2–3; ovate to nearly elliptical; dull chalky white; unmarked, but often nest stained; average size, 72.9 × 46.5 mm.

Boobies and Gannets: Sulidae

BLUE-FACED BOOBY, *Parasula dactylatra* (Lesson)

SPECIES ACCOUNT

Sula dactylatra of A.O.U. check-list, 1957 (see Appendix A). Masked Booby and White Booby of various authors. A large—but smaller than Gannet—plump sea bird with long, rather conical, slightly hooked bill; narrow pointed wings; pointed tail (bird tapers at both ends). *Adult*: white with black flight feathers and tail (Gannet has white secondaries and tail); yellowish bill; bluish gray or black bare skin on face (“mask”) and pouch; yellow eyes; olive (usually) feet. At least in adults, boobies have entirely feathered throats; gannets show a line of bare skin down throat. *Immature*: grayish brown above, darker (blackish brown) on flight feathers and tail; mainly white below; blackish bill and feet. Resembles the somewhat larger immature Gannet but with fewer white speckles on dorsal plumage; often shows dirty white patch on lower hindneck; has clear whitish (instead of dusky-streaked) belly. Length, $31\frac{3}{4}$ in.; wingspan, $5\frac{1}{4}$ ft.; weight, $4\frac{3}{4}$ lbs.

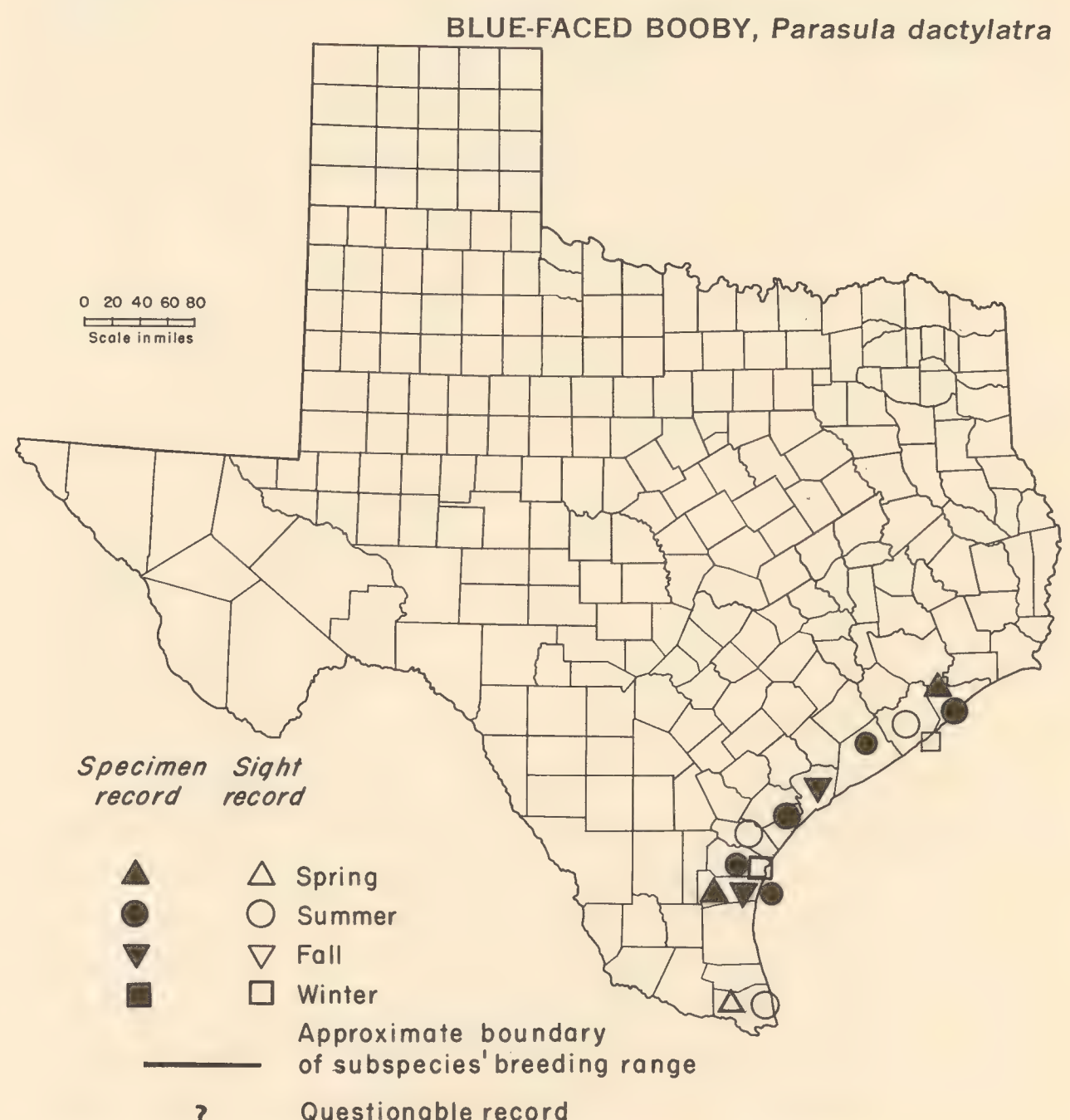
RANGE: On islands in tropical and subtropical Pacific, Atlantic, and Indian oceans. Wanders (mainly immatures) extensively over adjacent tropical and subtropical waters.

TEXAS: (See map.) *Dispersal*: Mar. 15 to Sept. 23. Scarce to rare and irregular (at least 33 definite records) on coast from Galveston to Port Isabel. Recorded in Galveston, Brazoria, Matagorda, Calhoun, Aransas, San Patricio, Nueces, Kleberg, and Cameron cos. Most reports are of individual birds (either dead or dying on beach), though a remarkable 6 immatures or sub-adults found during one month on Padre Island, Nueces Co. (May, 1968, G. W. Blacklock, Mary L. Grabowske, Kay McCracken, Emilie Payne, et al.). *Winter*: At least three definite sightings: Brazoria Co., San Luis Pass (3 late-immatures seen in company of 17 Gannets, Jan. 26, 1972, David Simon); Nueces Co., Port Aransas jetties (1 seen, Jan. 1, 1954, R. M. Lockwood); Nueces Co., Padre Island (“several reports,” winter 1969, fide Kay McCracken).

HAUNTS AND HABITS: Boobies are the tropical representatives of the nine-species Sulidae; they leave cold-water oceans to their cousins the gannets. Members of

this family are told from gulls by their long necks and pointed tails and their Brown Pelican-like manner of diving for fish.

The Blue-faced is the largest booby and the only one at all likely to visit Texas, usually in the form of a dead or dying individual washed up on the beach. The present species, like other sulids, nests on small oceanic islands, not one of which is located anywhere near Texas. The Blue-faced Booby's two-egg, sometimes one-egg, clutch is laid on the ground in a ring of the sitter's guano. The bird incubates mainly by folding the webs of its totipalmate feet around the eggs, since sulids, unlike birds in general, do not develop bare brood patches on the breast. One egg usually hatches several days before the other; ordinarily only the big chick survives. During the breeding season this mildly colonial species shares islands with its fellows, other boobies, and frigatebirds. Soon after fledging, the young head to sea for a period of wandering, but adults apparently seldom disperse after the breeding season. Mates stay paired throughout the year.



Strong and steady on the wing, boobies alternate slow regular wing-beats with glides. Birds usually feed throughout the day and often travel up to one hundred miles from their islands to fish. *P. dactylatra* ranges greater distances than do other boobies; far at sea, individuals have been seen perched on the backs of turtles. From thirty or forty feet in the air, a fishing Blue-face plunges vertically with wings partially folded back. It dives six to ten feet beneath the surface and stays under generally about six seconds. It grabs prey between its mandibles; food is swallowed while the bird is submerged or as it swims on the surface but with its head still underwater. Flying fish are its mainstay; occasionally squid are taken. Boobies often drag their tails as they waddle about on the ground. At night they roost on level ground, preferably near a cliff which facilitates their takeoff.

The Blue-faced Booby is silent at sea. The male's syrinx is not structured like the female's, thus the sexes produce unlike sounds. He has a whistle described as pathetic; she utters clamorous trumpeting sounds.

DETAILED ACCOUNT: ONE SUBSPECIES

ATLANTIC BLUE-FACED BOOBY, *Parasula dactylatra dactylatra* (Lesson)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper and lower parts white; primaries fuscous black, becoming white at extreme base; terminal portion of secondaries, of outer scapulars, and of greater wing-coverts fuscous; tail fuscous, basal half of two middle feathers and extreme base of others white. Bill yellowish horn color; bare skin of face and gular sac blue or black; iris yellow; legs and feet olive. At start of breeding season, base of bill orange-yellow in male, light red to pink in female; feet olive drab (male) or plumbeous (female). *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired by wear from first winter. Like first winter. *First winter:* Acquired by complete postjuvenile molt. Head and hindneck dark hair brown, finely speckled with dull white; whitish spot or short collar on lower hindneck; back hair brown or light hair brown, much mixed with white or pale gray; rump mouse gray, feathers edged with dull white, and thus appearing streaked; primaries and tail feathers fuscous black to fuscous; remainder of wing surface fuscous, lesser wing-coverts hair brown, much margined with dull white; chin dull white; throat dark hair brown, much mixed with white or wholly white; breast and abdomen white; lining of wing white, edge of wing mottled with hair brown. Bill and bare part of face slate color; iris yellow; legs and feet dark slate.

MEASUREMENTS: *Adult male:* Wing, 391.9–433.1 (average, 420.1) mm.; tail, 152.9–173.3 (166.1); bill (exposed culmen), 91.9–99.1 (95.8); height of bill at base, (35.1); tarsus, 53.1–57.9 (54.3); middle toe without claw, (78.0). *Adult female:* Wing, 404.1–439.9 (423.4); tail, 151.1–180.1 (164.8); bill, 91.7–102.6 (97.1); height of bill, 35.1–38.6 (36.8); tarsus, 52.1–56.9 (54.3); middle toe, 74.9–78.0 (76.5).

RANGE: Alacrán reefs off northern coast of Yucatán, s. Bahamas, Virgin Islands, Grenadines, Los Hermanos Islands, Fernando de Noronha, Abrolhos Islands (about lat. 17° S. off coast of Brazil), South Trinidad, and Ascension islands. Wanders to Texas, Florida, and Guyana.

TEXAS: *Dispersal:* Twelve specimens: Galveston Co., Galveston Island (June 30, 1953, C. E. Hall; Texas A&M University collection, no. 7074); Matagorda Co., Matagorda Bay (June 8, 1885, for D. H. Talbot; University of Iowa collection); Calhoun

Co., Pelican Island in Pass Cavallo (Sept. 6, 1937, L. K. Barclon); Aransas Co., Rockport (July 6, 1892, July 10, 1893, H. P. Attwater); Nueces Co. (2 females, June 6, 1968, Mary L. Grabowski; Welder Wildlife Refuge collection, nos. 1472, 1473); Nueces Co., n. Padre Island (male, June 10, 1970, Mack Simons; Texas A&I University collection, no. 382); Kleberg Co., n. Padre Island (Mar. 15, 1966, H. H. Hildebrand; Welder collection, no. 1474); Kleberg Co., Loyola Beach (female subadult, June 23, 1966, E. Bolen; Welder collection, no. 1510); Kleberg Co., 40 mi. south of Bob Hall Pier (female, Sept. 23, 1967, after Hurricane Beulah, B. Causey; Welder collection, no. 1405); Kleberg Co., n. Padre Island (female subadult, May 11, 1968, Bud Martin; Texas A&I University collection, no. 33). Bird found dead (specimen?): Galveston Co., Galveston Island (May 13, 1950, S. G. Williams).

BROWN BOOBY, *Sula leucogastra* (Boddaert)

SPECIES ACCOUNT

Sula leucogaster of A.O.U. check-list, 1957 (see Appendix A). White-bellied Booby of numerous authors. *Adult:* dark brown upper parts and chest, sharply contrasting with white breast, belly, crissum, and wing-linings; yellowish bill, legs, and feet. Nuptial male has blue tinge at base of bill. *Immature:* grayish brown, but paler (more grayish) in areas that will become white. Length, 29¼ in.; wingspan, 4 ft.; weight, to ca. 2½ lbs.

RANGE: Mainly tropical islands, both offshore and well removed from land masses, from e. Mexico, West Indies, and Cape Verde Islands, south to s. Brazil, Fernando de Noronha, and Ascension; from Red Sea, Amirantes, Chagos, Cocos-Keeling, and Christmas islands, s.e. Asia, Indonesia, Japan, Wake, and Hawaii to n. Australia and Tuamotu archipelago; and from Gulf of California to Ecuador. Wanders rather widely (chiefly nonbreeders) in tropical and subtropical waters.

TEXAS: *Casual:* One specimen: Nueces Co., Port Aransas (1 immature male, at rest on road by city hall, Sept. 21, 1971, Mr. and Mrs. H. O. Mueller, bird had severe neck injury and died on Sept. 25; preserved in University of Dallas collection, no. 1864, fide W. M. Pulich). Six definite sightings, one substantiated by photographs: Jefferson Co., 8 mi. offshore and 17 mi. southwest of Sabine Pass (1 seen, Aug. 18, 1961, L. E. Williams, Jr.); West Flower Garden Reef, 100 mi. south of Galveston (1 observed, June 8, 1972, Ralph Hunter); Calhoun-Aransas cos., Second Chain-of-Islands (June 25, 1948, Connie Hagar, Mr. and Mrs. R. W. Hill, and P. Mullinax); Nueces Co., 12 mi. offshore from s. Mustang Island (1 adult, Aug. 10, 1961, L. E. Williams, Jr.); Nueces Co., Padre Island (1 seen after Hurricane Beulah, Sept. 23, 1967, Bud Martin, et al.); Kleberg Co., n. Padre Island, 16 mi. south of Bob Hall Pier (1 immature found ill, Aug. 19, 1967, Bud Martin, George Parker; photographed in black-and-white by Emilie Payne, photos on file at Welder Wildlife Refuge; bird released Aug. 28).

HAUNTS AND HABITS: The Brown Booby nests on the ground on islands located mainly within the tropical

zone, near or far from land masses. It lays two pale blue to chalky eggs in a heap of trash or scrape on the ground, but only one chick survives. Like other boobies, it has a prolonged breeding season and at some stations may breed all year. Immatures, and a few adults, wander widely after the nesting season, but there is apparently no orthodox migration.

Early in the morning, birds fly to feeding waters, often as far as sixty miles from their islands, where they plunge mainly for fish. Dives, from thirty to fifty feet in the air—or sometimes only a few feet from the surface—are to a water depth of about six feet. The booby remains submerged from twenty-five to forty seconds; it swallows its catch either underwater or on the surface after it emerges. Flying fish, halfbeaks, and mullets are standard prey. R. C. Murphy found that the Brown Booby forages more in coastal water and muddy water than other boobies. Usually at dusk, birds return to roost, preferring cliff or hillside vantages, or sometimes trees. Near coasts, they perch on pilings or buoys; at sea, on turtles or riggings of ships.

On the wing, the Brown Booby is generally silent, although when harassed by a frigatebird, it will sound a single *karrk*. Vocalizations on nest islands have been variously described as quacks, grunts, brays, honks, and screeches. The female's harsh *kaak kaak kaak* is more strident than the male's *iruk iruk iruk*. Disturbed birds vigorously rattle their mandibles.

NOTE: The race most likely to occur on the Texas coast is *S. l. leucogastra*. However, the specimen reported by Pulich (see *Auk* 90 [1973]: 683–684) was not identified to race; also it is not the policy of the present work to identify subspecies from photographs. Hence, there follows no detailed account.

RED-FOOTED BOOBY, *Sula piscator* (Linnaeus)

SPECIES ACCOUNT

Sula sula of A.O.U. check-list, 1957 (see Appendix A). Only booby with a white tail (this fallible in immatures and some brown phase individuals); has bluish bill and red-orange legs. *Adult (white phase)*: white with black on tips of wings paling to dark grayish brown on secondaries (flight feathers of Blue-faced Booby are entirely black; the much larger Gannet has only primaries black, plus a white tail). *Adult (brown phase)*: basically grayish brown forequarters and wings, darker on upper back and flight feathers; creamy white hindquarters. *Immature*: essentially dull brown, including tail, but paler below, and sometimes with faint gray or brown breast-band. Length, 28½ in.; wingspan, 5 ft.

RANGE: Islands scattered in tropical seas, from Caribbean to Fernando de Noronha and South Trinidad; in Indian Ocean, from Bay of Bengal to Aldabra, Cocos-Keeling, and Christmas islands; in Pacific, from South China Sea, Philippines, and Hawaii to n. Australia and Tuamotu archipelago, also from Mexico's Tres Mariás

Islands and Revilla Gigedo group to Costa Rica's Cocos Island and the Galápagos.

TEXAS: *Accidental*: Two records: Aransas Co., Rockport (1 taken near Rockport, prior to 1910, mounted by Andrew Sorenson and long preserved at his shop, where identified by A. K. Fisher); Cameron Co., s. Padre Island (1 seen at close range, Aug. 26, 1968, Barton German).

HAUNTS AND HABITS: Among boobies the Red-footed is special: It is the only species of Sulidae, except the Northern Gannet, with an entirely white tail, and it is the only member of its family, except *Sula abbotti* of Christmas Island in the Indian Ocean, that nests in trees. Further, the Redfoot has the biggest eyes and is the most crepuscular of the boobies. One explanation of this is undoubtedly because squid on which it preys are near the surface in hours of dim light. The present species, like other boobies, dwells on small islands in warm oceans usually far from large land masses. A platform of sticks and coarse vegetation is constructed in a bush or tree (from about 8 to 35 ft. above the ground). One member of a pair must defend the nest at all times—for a period even the offspring assists—because neighbor boobies raze and carry off materials of an unattended nest. Several weeks before it learns to fly, the chick completely dismantles the nest in which it was brooded. The Redfoot appears to be largely sedentary, especially Atlantic Ocean individuals. It is colonial at all seasons.

Flight consists of several strong flaps alternated with long graceful glides. Since the Redfoot has much difficulty taking off from flat terrain, it usually launches from a windward perch on a tree or bush. Starting well before sunrise, birds fly, usually just above the waves, to deep-water fishing areas. Frequently they go as far as fifty miles out to sea. Dives for prey—chiefly flying fish and squid—are made from up to fifty feet above the surface; occasionally a bird catches a flying fish in mid-air. Badgering frigatebirds constantly force this booby to disgorge its catch. Birds generally return to roost in the late afternoon but will sometimes fish on moonlit nights.

The senior editor recalls a trying-to-go-to-roost Redfoot that seemed to live up to its booby (fool) name. For almost an hour on an evening in November, 1961, this *Sula piscator* attempted to land on the rigging of the *Hawaiian Farmer*, a slow freighter outward bound from Honolulu. The bird's landing approach in some thirty tries was always the same; it would fly in from aft, brake, and extend its big, red, totipalmate feet to grip the perch. Each time as the bird was braking, its intended roost would move forward just out of reach. If at any time it had put down its landing gear a few inches in front of the perch the bird could easily have caught it. The dark moonless night found this booby still on the wing over the mid-Pacific.

A loud rattling *waalk* and series of low *walk walk walk*'s are important nuptial vocalizations of the Red-footed Booby. When upset, birds sound loud screeching squawks.

DETAILED ACCOUNT: ONE SUBSPECIES

WEST INDIAN RED-FOOTED BOOBY, *Sula piscator piscator* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum and upper tail-coverts cream buff; remainder of upper parts white washed with cream buff; shafts of white tail feathers straw yellow; primaries and most of secondaries, except basal portions of inner webs, fuscous black or fuscous; secondaries margined on outer webs with neutral gray; lower surface, including lining of wing, white, a few of outer under wing-coverts fuscous to drab. Bill dull blue, tinged with red basally; bare forehead dull purplish red; naked skin around eye blue; gular sac dark slate or black; iris gray or brown; legs and feet red. *Adults, winter:* Acquired by complete postnuptial molt. Practically identical with nuptial adults. *Third nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults but with some dark brown or dull black mottling on back. *Third winter:* Acquired by complete postnuptial molt from second nuptial. Similar to third nuptial but with often more blackish mottling on upper surface. *Second nuptial:* (Apparently the same, or appears the same, as brown phase adult of some authors.—EDITOR) Acquired by partial prenuptial molt. Differs from third nuptial in having upper and lower parts mostly dark brown, excepting white lower back, rump, upper tail-coverts, tail, and crissum. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial but with less white. *First nuptial:* Acquired by partial prenuptial molt. Similar to second nuptial, but with less white on head, neck, and lower surface; rump, upper tail-coverts, and tail dark brown. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Upper parts olive brown, rather lighter on hindneck and upper tail-coverts; pileum and entire lower surface buff brown, latter area lighter; primaries fuscous black; secondaries chaetura black, outer margins hair brown. Bill plumbeous or dull black; naked skin around eye plumbeous; gular pouch flesh color; legs and feet red.

MEASUREMENTS: *Adult male:* Wing, 367.0–385.0 (average, 377.2) mm.; tail, 205.0–237.0 (218.9); bill (exposed culmen), 78.5–80.5 (79.5); height of bill at base, 25.9–31.5 (27.9); tarsus, 34.0–36.6 (35.1); middle toe without claw, 55.9–58.9 (57.4). *Adult female:* Wing, (374.9); tail, (199.2); bill, (80.0); height of bill, (27.9); tarsus, (36.1); middle toe, (62.0).

RANGE: Islands of Caribbean (Little Swan, Little Cayman, Navassa, Desecheo, some of the Grenadines, Los Hermanos, Trinidad, and Tobago), south in the Atlantic to Fernando de Noronha and South Trinidad.

TEXAS: *Accidental:* See species account.

GANNET, *Morus bassanus* (Linnaeus)

SPECIES ACCOUNT

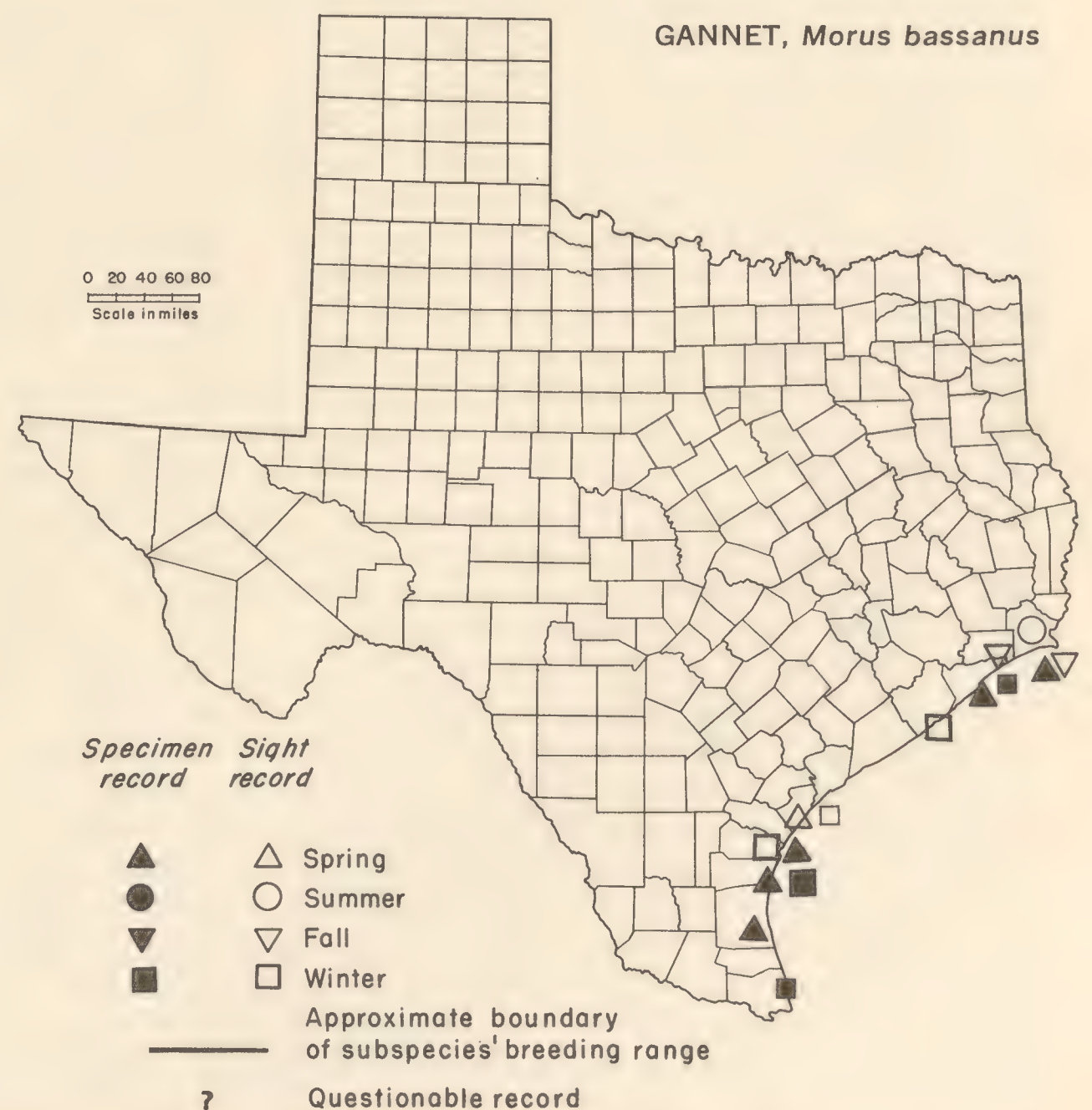
Northern Gannet of many authors. A large robust sea bird with heavy, tapering, slightly hooked, pale gray bill (usually held at downward angle in flight); narrow pointed wings; tapering tail (bird appears pointed fore and aft); blackish legs. *Adult:* white, except for buffy wash on head and neck; black primaries. *Immature:* at first essentially dark brownish slate with white speckles, gradually becoming splotched with more and more white. Length, 37½ in.; wingspan, 6¼ ft.; weight (male), 7½ lbs.

RANGE: Marine rocks, stacks, and islands in Gulf of St. Lawrence and off Newfoundland, Iceland, Faeroes, and British Isles. Winters off Atlantic coasts—on the west, south to Florida and Gulf of Mexico, rarely to

Texas (recorded from Veracruz); on the east, to Azores and Canary Islands, n. Africa, and Mediterranean.

TEXAS: (See map.) *Winter:* Early Oct. to early May (extremes: Sept. 20, June 5). Usually rare (at least 25 definite records) and irregular on upper and central coasts; casual (2 definite records) on lower coast. Recorded on beach in Jefferson, Chambers, Galveston, Brazoria, Aransas, Nueces, Kleberg, Kenedy, and Cameron cos. Remarkably high counts seen from shore, San Luis Pass, Brazoria Co.: 5 adults and 12 immatures (Jan. 26, 1972, David Simon, Bob Rodrigues); 10 adults and 15 in various subadult plumages (Jan. 27, 1972, T. B. Feltner). Occasionally fairly numerous farther offshore ("remarkably common," Gulf of Mexico, spring 1948, fide Ludlow Griscom; 1 adult flew over the *Captain Doc*, 17 mi. off Galveston, Feb. 26, 1961, Mr. and Mrs. J. B. Strickling and members of Texas Ornithological Society field trip; in same year on Nov. 30, scattered individuals observed flying 2 to 10 mi. off Bolivar Peninsula, Galveston Co., L. E. Williams, Jr.).

HAUNTS AND HABITS: The Gannet is the most spectacular sea bird of the chill gray North Atlantic—which ocean for ten centuries has been poetically called the "Gannet's Bath." Exceptionally gregarious during the breeding season, *Morus bassanus* nests on cliffs of rocky offshore islands, usually of the type called sea stacks. Some gannetries are so extensive that they extend far back onto sloping ground. Nests, of seaweed and debris, are usually very uniformly spaced in the colony; each pair's territory—about one square meter—is zealously protected, mainly by the male. Gannet pairs which have tried solitary nesting apparently have had little success. Young birds wander at sea for about the first three years of their lives; most, but not all, Gannets that fly as far as Texas are in imma-



ture plumage. After the breeding season, birds move to waters south of the nest stations. At this cool season they stay out of sight of land, as a rule, but rarely pass seaward of the continental shelf.

In flight, the Gannet's tapering body suggests a fat cigar. Rapid wing-beats with short glides carry the bird generally at a height of thirty to fifty feet over the water and at recorded speeds of twenty-five to forty-eight miles per hour. The bird has difficulty taking wing from flat ground or water; ideally it prefers to launch from a cliff edge. At especially crowded gannetries, nesters removed from precipices are at a great disadvantage when trying to lift off. As it fishes, the Gannet dives anywhere from three feet to one hundred feet above the water's surface, usually from thirty or forty feet. Plummets may be vertical but are more often slanting. The bird usually makes a half-turn as it descends, and when it strikes the water, a jet of white spray shoots up as high as ten feet. A subcutaneous cushion of air cells, indirectly connected with its lungs, protects the Gannet from injuring itself during these violent impacts. This bird has the reputation of being a shallow diver (it usually stays under about 10 seconds), but individuals have been caught in nets set as deep as fourteen fathoms. Schooling fish are standard prey, including sand lance, herring, pilchard, menhaden, mackerel, capelin; occasionally a squid is taken.

Vocalizing is apparently confined to the gannetry. The standard cry is a guttural barking *urrah*, varying to *urroo*, *oorah*, or *wrow*, or sometimes to a strident *arrr*. Young birds yap rapid series of *uk* notes.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage* (fourth nuptial or older): Acquired by partial prenuptial molt. Forehead cartridge buff, deepening on crown and upper half of sides of head to cream buff and to chamois on upper part of hindneck, this gradually fading into cream buff on sides of upper neck, to cartridge buff on middle of upper throat, and slightly tinging sides of chin; primaries fuscous, passing on inner portion of inner vanes, except at tips or long terminal portion, from fuscous to light fuscous, or to between hair brown and drab, or between drab and light drab, the lighter color occupying on inner feathers only the basal portion of inner webs; shafts of primaries fuscous black, terminally shading to cream white at base, under side of shafts of primaries cream color on outermost to light cartridge buff on inner feathers; primary coverts and alula fuscous like primaries and paler on inner webs; entire remaining plumage, including tail, pure white or cream white, shafts of tail feathers cream color. Bill bluish white or pale bluish gray, basally somewhat tinged with green, with slate-colored lines at sutures; orbital ring pearl blue; bare face and pouch black; inside of mouth bluish white but partly black; iris pale gray, white, or straw yellow with fine blackish outer ring; legs and feet brownish black; three stripes down front of tarsus and along top of each toe apple green, pale bluish green, or pale yellowish blue-green; sometimes front of tarsus and lines on toes glaucous blue; claws grayish white. Female like male but smaller. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but with hindneck paler and duller, sometimes whitish; forehead more whitish. *Fourth winter:* Acquired by complete postnuptial molt. Similar to adults in winter, but a few wing-coverts and upper tail-coverts wholly or partly hair brown or fuscous; scattered secondaries and sometimes tertials, in part or wholly, fuscous to hair brown; some tail feathers, particularly middle pair,

fuscous, changing basally to hair brown or dull brownish white; lining of wing with a very few hair brown feathers. *Third nuptial:* Acquired by partial prenuptial molt. Similar to fourth winter, but hindneck chamois as in nuptial adults; secondaries and tail mostly fuscous or hair brown, scattered feathers amounting to about one-half wing-coverts, upper tail-coverts also fuscous, and back mottled with many fuscous feathers; under wing-coverts anteriorly mostly fuscous with a few small white spots and mixture of white or light hair brown feathers. *Third winter:* Acquired by complete postnuptial molt. Similar to third nuptial, but hindneck duller and paler. Similar to adults in winter, but practically all secondaries fuscous; tail fuscous, except two or three feathers which are wholly or partly white; wing-coverts nearly all fuscous; scapulars, tertials, back, and upper tail-coverts with about half the feathers fuscous or hair brown; lining of wing with less white, more extensively fuscous, hair brown, and gray with few or no scattered white feathers, posterior coverts more grayish (less whitish). *Second nuptial:* Acquired by partial prenuptial molt. Similar to third winter, but hindneck with only slight buffy tinge; pileum and hindneck with many fuscous or hair brown feathers; back, upper tail-coverts, except longest, and all tail feathers fuscous, but back with a few very small and inconspicuous white spots; secondaries and wing-coverts all fuscous, except for a few white feathers and spots on latter. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial, but tail and wings with coverts all fuscous, longest upper tail-coverts about half hair brown instead of wholly white; wings with almost no white, at most with a few dull white or brownish white spots on wing-coverts; pileum and hindneck mostly fuscous or hair brown, extreme forehead whitish, finely streaked with fuscous, and fuscous feathers of pileum and hindneck tipped or spotted obscurely with hair brown or brownish white, this on lower hindneck becoming more whitish and more in form of streaks, rump also more or less spotted subtriangularly with dull white; cheeks, throat, and sides of head much more extensively fuscous than in second nuptial; lower surface much spotted or streaked with hair brown, covering altogether about half total surface of under part of body, rest being white; posterior under wing-coverts still more deeply gray (less whitish). *First nuptial:* Acquired by partial prenuptial molt. Similar to second winter, but pileum, hindneck, sides of head, and throat more solidly fuscous, all these parts with very numerous and very minute more or less triangular spots of dull white; upper tail-coverts mostly fuscous or fuscous black; back, rump, and wings with shorter, more triangular white spots, wing-coverts with greater number of small white triangular spots than in second winter; lower surface more extensively dark hair brown or fuscous, white occupying only about one-fourth entire lower surface, lower tail-coverts mostly dark hair brown to light fuscous. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Similar to first nuptial but upper tail-coverts with very much more white, longest nearly all white; entire upper surface, including wing-coverts, numerous and conspicuously marked with triangular spots of white, these spots very much larger than in first nuptial, smallest on head and gradually increasing in size until they become largest on shorter upper tail-coverts; chin and throat with numerous, but very much larger, white spots; jugulum, breast, abdomen, and sides much more extensively whitish though numerous spotted with hair brown; flanks hair brown or fuscous with large triangular spots of white, lower tail-coverts white, broadly streaked or spotted with hair brown. Bill black or dark brown; iris grayish blue; legs and feet brownish black, lines down front of tarsus and along top of each toe dark gray; webs of toes drab; claws white tinged with drab.

MEASUREMENTS: *Adult male:* Wing, 453.9–508.0 (average, 479.8) mm.; tail, 184.9–217.9 (200.7); bill (exposed culmen), 93.5–104.9 (100.8); height of bill at base, 31.5–35.1 (33.3); tarsus, 59.9–66.0 (62.7); middle toe without claw, 80.0–94.0 (89.7). *Adult female:* Wing, 460.0–496.1 (476.0); tail, 184.9–209.0 (197.4); bill, 94.5–102.1 (98.3); height of bill, 29.9–34.0 (31.8); tarsus, 62.0–66.0 (63.2); middle toe, 86.6–93.0 (90.2).

TEXAS: *Winter:* Two specimens in Texas A&M University col-

lection: Jefferson Co., 9 mi. east of High Island (Apr. 2, 1967, T. C. Maxwell, no. 7210); Brazoria Co., on beach 1 mi. east of highway 332 (adult, Feb. 1, 1972, Fred Collins, specimen preserved as skeleton). One specimen in Texas A&I University collection: Kenedy Co., near Yarborough Pass (Mar. 1, 1969, Don Woodard, Bud Martin, no. 224). One specimen in Corpus Christi Museum: Cameron Co., Padre Island (Feb. 10, 1970, Don Woodard, no. 73A014). Four specimens in Welder Wildlife Refuge collection: Nueces-Kleberg co. line, n. Padre Island 1 mi. south of Bob Hall Pier (adult, Mar., 1967, Mary L. Grabowski, no. 1406); Kleberg Co., Padre Island Beach (adult, only skull preserved, Mar., 1966, Bud Martin, no. 1476); Kle-

berg Co., n. Padre Island (immature, Mar. 15, 1966, H. H. Hildebrand); Kleberg Co., n. Padre Island 15 mi. south of Bob Hall Pier (immature female, Jan. 20, 1968, Bill Causey, no. 1407). A dead Gannet has been carefully identified on each of the following dates (apparently none preserved as specimen): Jefferson Co., 10 mi. east of High Island (June 5, 1936, Corrie Hooks); Galveston Co., Galveston (Sept. 20, 1952, S. G. Williams; Mar. 23, 1957, J. O'Neill; Mar. 31, 1962, H. Patten); Aransas Co. (May 1, 1944, given to B. A. Earp; Feb. 22, 1949, fide Connie Hagar); Nueces Co., n. Padre Island south of Corpus Christi Pass (banded bird, Apr. 5, 1959, finder unknown).

Cormorants: Phalacrocoracidae

DOUBLE-CRESTED CORMORANT, *Phalacrocorax auritus* (Lesson)

SPECIES ACCOUNT

A large blackish bird, somewhat like a loon or goose, but with rather small head; long agile neck; long, cylindrical, hook-tipped bill; fairly long tail. *Adult*: green-glossed black head, neck, under parts; bronzy black back, wings; blackish tail; orange or yellow-orange loreal skin and gular pouch; in nuptial dress, acquires short, inconspicuous recurved crest of black feathers behind each eye. *Immature*: dark brownish crown becoming grayish on head and sides of neck; grayish brown upper back darkening to blackish on lower back and tail; whitish to pale cinnamon foreneck and breast becoming dark brownish on posterior under parts; whitish or yellowish loreal skin, sometimes blackish-tinged; dull yellow throat pouch, usually blackish-splotted. Compare carefully in all plumages with Olivaceous Cormorant (see below). Length, 32¼ in.; wingspan, 4¼ ft.; weight, 5 lbs.

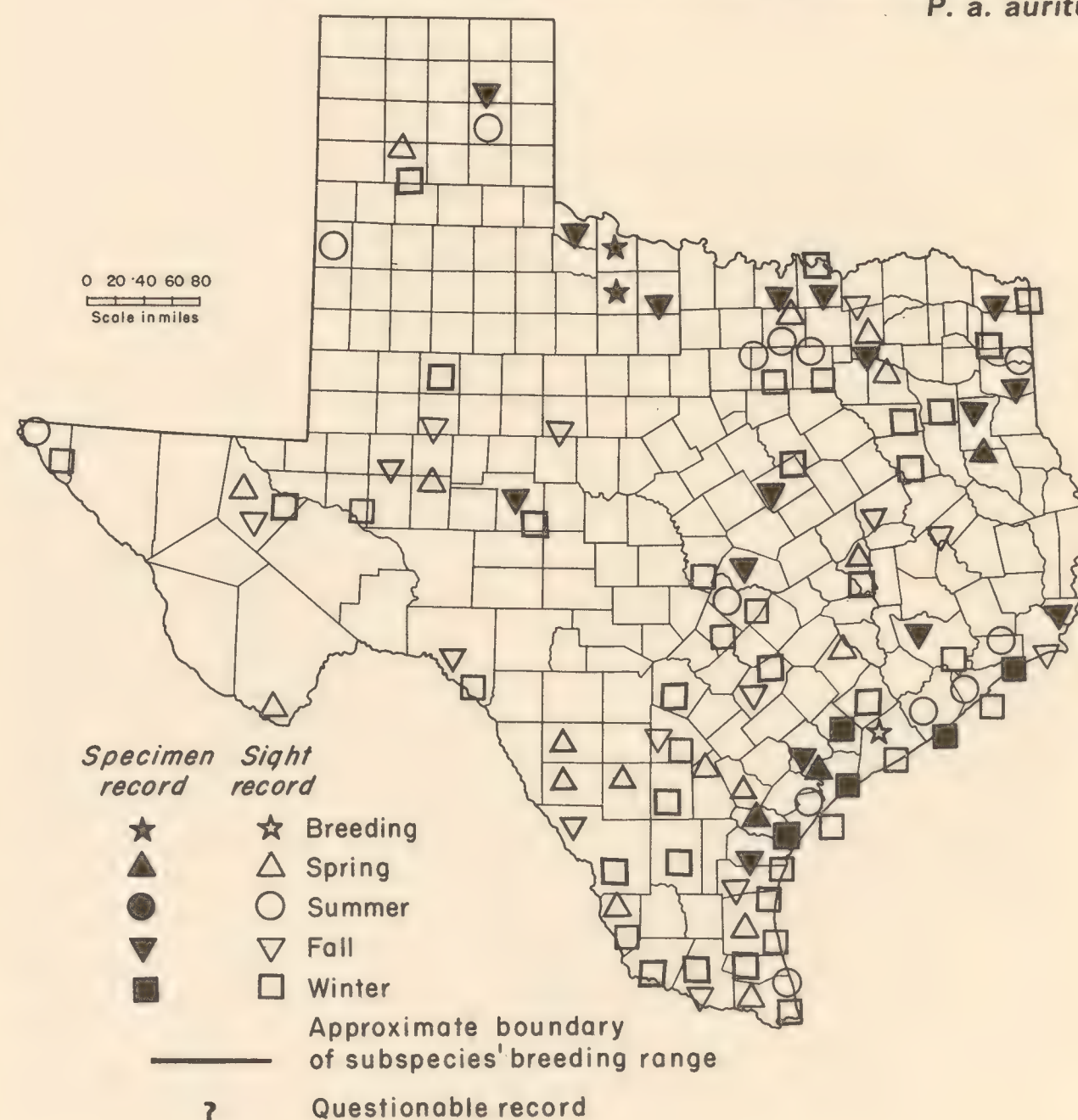
RANGE: Locally and irregularly from Alaska Peninsula and Kodiak Island, south along Pacific to Baja California and adjacent coast of mainland Mexico; from c. Alberta, s. Ontario, and Newfoundland, south to n. Utah, n.e. Colorado, Wisconsin, and Nova Scotia; and from s. North Carolina to Florida and e. Texas; also n. Bahamas, Cuba and Isle of Pines. In winter withdraws from n. Great Plains, Great Lakes region, Newfoundland, and Nova Scotia; occurs along Gulf of Mexico to Yucatán Peninsula and British Honduras.

TEXAS: (See map.) *Breeding*: Three definite sites: Wilbarger Co., Santa Rosa Lake (20 pairs found nesting—nests containing mostly young—in colony with Great Blue Herons and Common Egrets, May 21, 1938, R. L. More, G. E. Maxon; many nests with eggs and young found in same colony and eggs collected, May 20, 1939, More and Maxon; 6 adults and 8 young in 3 nests found at same colony, Aug. 3, 1938, H. C. Oberholser); Baylor Co., upper end of Lake Kemp (set of 4 eggs collected from nest in dead cottonwood tree standing in lake in small colony of Common Egrets, incubation about one week advanced, June 19, 1937, More); Matagorda Co., Matagorda Peninsula and nearby island, near Brown Cedar Cut (number of nests with either eggs or young found, July 10, 1926, J. J. Carroll).

Locally uncommon to rare as nonbreeding summer lingerer along coast and inland irregularly over much of state—recorded in Bailey, Gray, Denton, Tarrant, Dallas, Marion, Harrison, and Travis cos. *Migration*: Early Mar. to late May; mid-Aug. to mid-Nov. Locally very common (in flocks) to uncommon over eastern half west to about 100th meridian; irregularly uncommon to rare in western half. *Winter*: Mid-Nov. to early Mar. Locally very common to uncommon along entire coast; locally fairly common to uncommon inland in eastern half; scarce to rare west of 100th meridian.

HAUNTS AND HABITS: In North America, the Double-crested Cormorant is the most widely distributed of the Phalacrocoracidae—a cosmopolitan family of thirty members, many of which have green eyes. The present species is the only nearctic cormorant that breeds extensively in inland freshwater habitats. Nesting sites must be close to waters that provide a stable food supply and are unmolested by man. The size of breeding colonies varies from several pairs to many hundreds, depending on how well an area fulfills the above requirements. The species has bred successfully from

DOUBLE-CRESTED CORMORANT, *Phalacrocorax auritus*
P. a. auritus



below sea level, as at Salton Sea, California, to over 5,600 feet. Because rookeries are easily disrupted and frequently abandoned, the Doublecrest's range is more or less in a state of flux. Migrations are keyed to finding unfrozen fishing waters; most northern birds move to seashores during cold months. Transients, by day or night, pass closely along coastlines and through river valleys.

In taking flight, the Doublecrest initially loses altitude—it frequently dips its tail into the water if its perching snag is low—but when the bird builds up air speed it flies well. On the wing, the cormorant might be mistaken for a loon or a goose; however, its wingbeats are slower than a gaviid's and faster than those of a goose. Over water, flocks usually fly low in wavering lines or irregular V-formations; overland, they often fly as high as 3,000 feet, and even higher when they cross mountains in Colorado, Pennsylvania, and West Virginia. J. P. Grinnell noted them at 7,200 feet in Baja California. Flight speed recorded on a windless day was 48 m.p.h. The Doublecrest, like other cormorants, shows a marked preference for perching on dead trees, snags, posts, or rocks in or overhanging water, or on bridges or buoys. When perched, its posture is very erect, the long slim bill usually tilted skyward; often the wings are fully spread, drying. When swimming on the surface, a bird controls its buoyancy by adjusting its body feathers; sometimes it floats with only its neck exposed, suggesting a drifting tree branch. Diving is done from the water's surface—cormorants never plummet from the air. The bird dives either with a forward lunge or merely by sinking. Submerged, *Phalacrocorax auritus* paddles forward rapidly by using its large, totally webbed feet. Thirty seconds is the average time underwater; the usual depths, between five and twenty-five feet. The Doublecrest feeds alone or in loosely organized parties. Individuals all face the same direction and submerge more or less simultaneously. Prey fish, of little economic importance, include gunnel, sculpin, sand lance, capelin, herring, flounder, a few eel; crustaceans, amphibians, aquatic insects, and plants are eaten miscellaneously. Cormorant wastes are high in nitrates and phosphates; one South American species—the Guanay, *Phalacrocorax bougainvillii*—whose guano is marketed, has earned a reputation as the most valuable wild bird in the world. Night roosts are usually in trees on mainland, but on the ground on small islands. Cormorants generally fall asleep just after sunset and sleep soundly until just prior to sunrise. Throughout the day, except during the hectic nesting season, foraging is interrupted with periods of wing drying, napping (sometimes while afloat on the water), preening, and bathing.

The alarm note of the Double-crested Cormorant is a bullfroglike grunt. On arrival at the breeding grounds, displaying individuals sound a long (about 30 seconds) series of *ok ok ok*'s; this is no longer given after the eggs have been laid. As long as the nest is defended, birds sound low *tic tic tic*'s. Another exchange between breeding birds is a very loud, roaring

r-r-r-o-o-oorp. Doublecrests are seldom vocal off the breeding ground.

CHANGES: The Double-crested Cormorant is still numerous and widespread in Texas as a migrant and winter resident—the many hundreds of livestock watering lakes constructed in the past thirty years have aided it. However, the bird apparently no longer nests in the state. The last reported breeding was in the north central county of Wilbarger, May 20, 1939 (see TEXAS section for details). The Cooperative Fish-eating Bird Survey, conducted in late May and early June, 1969, along the entire coast found no Doublecrests—not even a late migrant or summer lingerer. However, the difficulty of separating this species from the Olivaceous Cormorant is such that it is likely some observers, especially those in airplanes and boats, mistook lingerers for *Phalacrocorax brasilianus*.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN DOUBLE-CRESTED CORMORANT, *Phalacrocorax auritus auritus* (Lesson)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper and lower parts glossy dark bluish green; tail dull black; wings chaetura black; centers of feathers of wing-coverts, lower hindneck, and middle of back fuscous to light fuscous with slight greenish gloss; short nuptial plumes on sides of head dull black. Maxilla black or greenish slate, mottled with gray or yellow along sides, but mandible dull yellow, blue, or clove brown mottled with white and cinereous; loreal region, orbital region, and gular sac orange or cadmium yellow; eyelids and interior of mouth cobalt blue or ultramarine blue; iris emerald green; legs and feet black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but nuptial plumes on head lacking; bare skin of lores and gular sac yellow; blue of mouth and eyelids absent. *Second nuptial:* Acquired by wear from second winter. Similar to nuptial adults, but lacks black nuptial head plumes. Iris Nile green. *Second winter:* Acquired by complete postnuptial molt from first nuptial. Practically identical with adults in winter. *First nuptial:* Acquired by wear from first winter. Similar to this, but somewhat duller and paler. *First winter:* Acquired by complete postjuvinal molt. Upper parts fuscous or fuscous black with greenish gloss, centers of feathers on back hair brown, thus imparting scaled effect; wings fuscous black; centers of feathers on scapulars and wing-coverts dull hair brown; tail chaetura black with glaucous sheen; throat pale fuscous; breast and jugulum fuscous white, centers of feathers light fuscous or drab; sides chaetura black; remainder of lower parts fuscous, somewhat mixed with paler; lower tail-coverts and lining of wing chaetura drab. Maxilla clove brown or dull brownish yellow, but base below nostrils cream color; corner of mouth cadmium yellow; mandible buffy yellow, but base cadmium yellow; line from above eye to culmen cadmium yellow; rest of bare space clay color mottled with dull black; gular sac dull yellow or cadmium yellow; iris greenish gray; tarsus and toes black. *Juvenal:* Acquired by postnatal growth. Dull black, of short thick down. *Natal:* None. Young hatch naked; skin at first brownish, turning purplish black within twenty-four hours; black eyes open in three to five days.

MEASUREMENTS: *Adult male:* Wing, 318.0–337.1 (average, 326.9) mm.; tail, 145.0–163.1 (156.7); bill (exposed culmen), 55.9–62.5 (59.7); height of bill at base, 17.0–20.6 (19.3); tarsus, 64.0–70.6 (67.8); middle toe without claw, 65.0–71.9 (69.1). *Adult female:* Wing, 300.0–313.9 (308.3); tail, 135.9–147.1 (140.2); bill, 54.1–64.0 (57.2); height of bill, 16.5–18.3 (17.8); tarsus, (66.8); middle toe, 65.0–71.1 (67.8).

RANGE: C. Alberta to Newfoundland, south locally to Utah, n. and e. Texas, s. Indiana, and Massachusetts. Winters locally

from s. New Mexico, Illinois, and Massachusetts to U.S. Gulf coast; also rarely to Bermuda and Cuba.

TEXAS: *Breeding*: No skin, but eggs collected in Wilbarger and Baylor cos. (see species account). *Migration*: No specimen taken outside of general winter range (see species account). *Winter*: Taken northwest to Roberts (Nov. 4), east to Bowie (Nov.) and Orange (Nov. 23), south to Calhoun and Nueces (Nov. 5) cos. One shot (specimen?): Tom Green Co., near San Angelo (fall 1880, W. Lloyd).

NESTING: *Nest*: On rocky sea islands or islands in bays or lakes; on ledge, cliff, or level ground, or in tree or bush, often in colonies; platform, sometimes large and well constructed, at times of few materials, chiefly sticks, weed stalks, seaweed, grasses, feathers, bark, and straw; lined with grasses and seaweed, sometimes decorated with bits of spruce, cedar, or other twigs, gull feathers, bark, or even dead crabs. *Eggs*: 2-7, rarely 9 (latter possibly laid by two birds), usually 3-4; oval to cylindrical ovate; greenish blue, light blue, or bluish white, overlaid with chalky deposit; unmarked but often nest stained; average size, 61.7×38.9 mm.

OLIVACEOUS CORMORANT, *Phalacrocorax brasilianus* (Gmelin)

SPECIES ACCOUNT

Phalacrocorax olivaceus of A.O.U. check-list, 1957 (see Appendix A). Brazilian, Mexican, Neotropic, and Bigua Cormorant of various authors. Resembles the Double-crested Cormorant but is more diminutive with smaller head, thinner and shorter beak, and slimmer neck; has duller, less extensive greenish yellow (not orangish) loreal skin and throat pouch, the latter terminating on cheek in a point (comparable area in Doublecrest is round and extends farther onto side of face); also scapular feathers end in dull points (those of Doublecrest are round-ended). *Adult*: greenish- and purplish-glossed black head and neck; glossy olive blackish on back and wings; glossy blackish on rest of plumage; in nuptial dress, acquires narrow border of white feathers at rear termination of throat pouch and scattered short wispy white feathers on head and neck. *Immature*: smaller and usually paler than young Doublecrest; largely grayish brown or brownish above; whitish or buffy foreneck and most of under parts. Length, $26\frac{1}{2}$ in.; wingspan, $3\frac{1}{2}$ ft.; weight, 3 lbs.

RANGE: On and near coast of Texas and s.w. Louisiana, south through Mexico, Central America, and South America to Tierra del Fuego. Wanders widely during nonbreeding season.

TEXAS: (See map.) *Resident* (largely): Breeds, late Jan. (courtship as early as late Dec.) to late Oct. (eggs, Feb. 8 to Oct. 16) from near sea level to—at least once—about 500 ft. Locally uncommon—formerly very common—to scarce along coast and inland in Starr, Brooks, Victoria, and Colorado cos.; has nested in Travis Co., Lake Travis (summer 1941, a small nesting colony located in tops of recently drowned pecan trees produced young, in spite of persecution by fishermen, fide Roy Bedichek). Tends to move southward in winter, becoming scarce to rare over all range north of about 27th parallel; locally fairly common—formerly very common—to uncommon from 27th parallel south

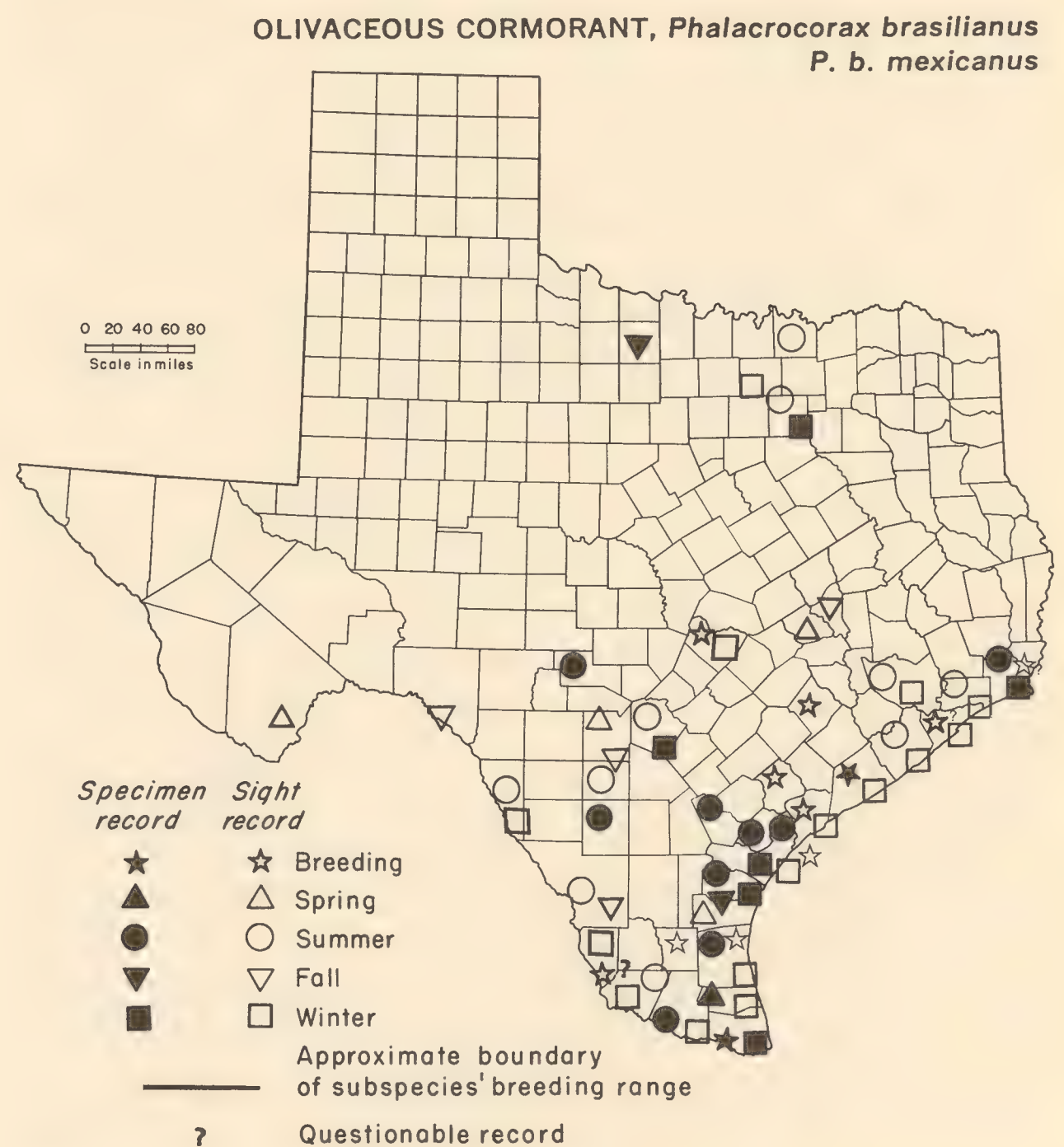
to Mexican border. *Dispersal*: Wanders (especially postnuptially) inland to Brewster, Pecos (see detailed account), Kerr, Travis, and Brazos cos., and into north central Texas.

HAUNTS AND HABITS: The Olivaceous Cormorant is the only truly neotropical (i.e., New World warm-water) member of its family. Outside of a few stragglers as far north as Colorado, Kansas, and Illinois, the only areas in the United States where the bird occurs are coastal Texas and extreme southwestern Louisiana. In parts of South America where it has little competition from other cormorants, the species displays great diversity in its haunts. It ranges from seacoasts, lowland marshes, and rain-forest rivers of the Amazon region to swift mountain streams and desert areas of the Andes. Only a relatively few breeding colonies are on record for the species, all of which are restricted to the vicinity of water. Although there is no formal migration, the postbreeding dispersal, apparently largely in search of food, is quite extensive.

In flight and behavior, this smaller, trimmer cormorant resembles the Doublecrest. It perches very erectly—often with wings and tail spread—on trees, snags, or rocks in or near water. It fishes with little difficulty in surf as well as rushing river currents. Preferred prey of Texas individuals seems to be top minnows (*Gambusia*); other freshwater fish, frogs, tadpoles, dragonfly nymphs, and some bits of plants are also taken. Formerly it fished much in Galveston, Matagorda, Lavaca, San Antonio, Copano, Corpus Christi, Baffin, Laguna Madre, and other Texas saltwater bays.

In alarm or when foraging in a large group, the Olivaceous Cormorant grunts or croaks rather piglike noises.

CHANGES: All resident fish-eating birds along the



Texas coast have declined since the military-industrial complex started booming during World War II. Of the formerly common breeders, hardest hit was the Brown Pelican which has been close to extirpation in the state since 1960. At the same time, the Olivaceous Cormorant underwent a crash only slightly less drastic. For the benefit of wildlife historians there follows a list of Texas breeding colonies of *Phalacrocorax brasilianus*:

Upper coast: Jefferson Co. (40 pairs nested, summer 1965, Alexander Sprunt IV); Eagle Lake, Colorado Co. (small nesting colony, June 12, 1936, Alexander Sprunt, Jr.); same place, on northern part of lake (3 nests, May 14, 1936, J. J. Carroll); near mouth of Colorado River, Matagorda Co. (eggs taken, late May, 1883, B. F. Goss); Bay City rookery, Matagorda Co. (at least one nest with eggs, May 4, 1947, T. C. Meitzen).

Central coast: Guadalupe River, 4 mi. southwest of Bloomington, Victoria Co. (125 nests with eggs or young, May 27, 1930, R. W. Quillin); same place (8 nests with 4 eggs, 4 nests with 5 eggs, and many nests containing young in all stages of growth up to about two-thirds fledged, May 24, 1930, A. J. Kirn); islands near Carroll Island, Aransas-Calhoun co. line (nests with eggs or young, May 26, 1937, J. J. Carroll).

Lower coast: Lake near Arroyo Colorado, Cameron Co. (large colony nesting, Apr. 25, 1937, H. C. Blanchard); Port Isabel, Cameron Co. (nests found, May 3-28, 1921, J. R. Pemberton); Brownsville, Cameron Co. (eggs collected, Oct. 16, 1903, and Feb. 8, 1905, F. B. Armstrong); Cameron Co. (nestling specimen, Aug. 29, 1923, R. D. Camp); Laguna de los Muertos, Cameron Co. (eggs taken, Sept. 7, 1923, Camp).

In addition, two inland nesting sites have been noted: dead trees in Lake Travis (formerly called Marshall Ford Lake), Travis Co. (1 nest collected—and donated to Texas Memorial Museum—from a small colony that produced a considerable number of young in 1941 only, Roy Bedichek); in retama (*Parkinsonia aculeata*) trees in water 4 to 5 ft. deep at rookery on Vargas Ranch, 8 mi. southeast of Falfurrias, Brooks Co. (3 nests observed, summer 1968, Eva Mae Evans, A. W. O'Neil, Pearl Witcher).

Apparently nobody bothered to take a comprehensive count of Olivaceous Cormorants prior to 1939 when thousands ranged Texas lakes and Gulf coast. The Cooperative Fish-eating Bird Survey of May and June, 1969—nine years after this cormorant's great depletion—found 400 birds on the upper Texas coast, 8 on the central coast, and 1 on the lower coast.

Also in the breeding season of 1969, cooperators associated with the fish-eating bird survey made a determined effort to locate breeding colonies of *Phalacrocorax brasilianus*. Only three rookeries were found: one of the Vingtune Islands, Chambers Co. (150 pairs nested); Humble oxidation pond near Baytown tunnel, Harris Co. (25 pairs built nests); mesquite trees in Rosita Lake, an intermittent lake in Willacy Co. (40 pairs attempted to nest but were driven out by intense hail storm and apparently did not re-nest, Don Woodward).

Numbers of breeders remain very low into the 1970's. However, in 1970, A. E. Whitehead, Audubon warden at Vingtune Sanctuary (Chambers Co.) reported that 500 adult "cormorants," with 250 nests, fledged 600 young to the flying stage.

Recent (Dec. 29, 1971) nuptial activity has been observed at the southeast corner of Falcon Reservoir (Starr Co.). Here, 70 Olivaceous Cormorants, many in breeding plumage, were seen perched in a dead tree standing in water; some males were presenting sticks to females (E. B. Kincaid, Jr., et al.). Perhaps some pairs were able to nest if the fishermen didn't bother them overmuch.

DETAILED ACCOUNT: ONE SUBSPECIES

MEXICAN OLIVACEOUS CORMORANT, *Phalacrocorax brasilianus mexicanus* (Brandt)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head and neck, posterior upper parts, and lower surface black with purplish or greenish sheen; lower hind-neck, back, scapulars, and wing-coverts chaetura drab or hair brown, margined with glossy black; wings and tail chaetura black; secondaries chaetura drab; superciliary region and sides of neck more or less speckled with white; back of head and sides of neck with scattered, short white nuptial plumes; rear edge of throat pouch with narrow border of white feathers. Bill brownish flesh color or drab gray, but culmen dull black; gular sac dull yellow or dull ochraceous buff; iris terre verte or greenish blue; legs and feet black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but lacking white plumes of head and neck; these parts are somewhat mixed with dark brown. *First nuptial*: Acquired by wear from first winter. Similar to first winter but lighter, particularly on throat and abdomen. *First winter*: Acquired by complete postjuvenile molt. Pileum and hindneck fuscous to fuscous black; rump and lower back black with greenish gloss; mantle hair brown with broad blackish edges producing conspicuous scalelike appearance; tail fuscous black to chaetura black; wing-quills fuscous to fuscous black; lining of wing fuscous black; chin buffy white; jugulum and sides of neck light fuscous, deepening on abdomen and lower tail-coverts. Bill brown, culmen and upper part of mandible darker, gular sac brown; iris green; feet black. *Juvenile*: Acquired by postnatal growth. Above and below fuscous to fuscous black (rather darker anteriorly) and of thick down. Gular sac yellow. *Natal*: None. Bird hatched naked; skin blackish gray.

MEASUREMENTS: *Adult male*: Wing, 258.0-270.0 (average, 263.4) mm.; tail, 151.9-170.9 (159.8); bill (exposed culmen), 45.0-52.1 (48.0); height of bill at base, (16.0); tarsus, 50.0-55.1 (52.3); middle toe without claw, 52.1-58.4 (55.3). *Adult female*: Wing, 241.0-253.0 (245.9); tail, 141.0-154.9 (145.8); bill, 42.9-48.0 (45.7); height of bill, 14.5-15.0 (14.7); tarsus, 48.5-52.1 (50.3); middle toe, 50.5-55.9 (52.8).

RANGE: S. Texas and s.w. Louisiana (much reduced in United States), south through lowlands of e. Mexico and Central America to n. Nicaragua; also Bahamas, Cuba and Isle of Pines.

TEXAS: *Resident* (largely): Collected along and near coast northeast to Jefferson, south to Bee, Cameron, and Hidalgo, west to La Salle cos. *Dispersal*: Four specimens: Pecos Co., Fort Stockton (fide H. E. Dresser, Jan., 1866, *Ibis*, 2d ser. 2:45); Bexar Co., San Antonio (Feb. 13, 1898, H. P. Attwater); Archer Co., 14 mi. south of Electra (Oct. 12, 1920, A. T. Bryce); Dallas Co. (Feb., 1939, identified by W. A. Mayer). Bird shot (specimen?): Kerr Co., south fork of Llano River (July 26, 1899, H. Lacey).

NESTING: *Nest*: On coastal islands and in coastal marshes and swamps, occasionally inland lakes; usually in colonies; in tree, bush, or on ground or rocks, usually over or near water; rude platform of sticks, twigs, weeds, and similar materials. *Eggs*:

3-5, usually 4; oval to cylindrical ovate; greenish or bluish white, overlaid with chalky deposit; unmarked, but often nest stained; average size, 54.1 × 33.8 mm.

[RED-FOOTED CORMORANT, *Phalacrocorax gaimardi* (Lesson)]

Also known as Red-footed Shag and Gray Cormorant. A medium-sized cormorant. *Adult*: mouse gray with elongate white patch on each side of neck; yellow-orange bill; bright red facial skin and feet; has high-pitched, chirping call resembling that of a song-bird. *Immature*: mostly brown but with brownish white mottlings on wing-coverts and under parts; white neck-patches dull; bill, skin of face, and feet slaty brown. Length, 28 in.; weight, ca. 4½ lbs.

RANGE: Cold-water coasts from Peru south through Strait of Magellan, thence north in Atlantic to Puerto Deseado, Argentina.

TEXAS: *Hypothetical*: One sighting, only record for state—indeed, for North America: Galveston Co., Galveston (Dec. 28, 1946, J. M. Heiser, Jr., G. G. Williams, and F. G. Watson). These three reliable observers studied the bird for about one hour at a distance of about 25 yards, as it perched on a piling near shore at Anderson Ways Rd. on West Bay. Points noted: (1) approximate size of Olivaceous Cormorant; (2) white patch on each side of throat about size of silver dollar; (3) plumage black (note: not described as black in any book consulted by senior editor), except for white patches; (4) red feet. The bird did not seem ill or disabled and ended the observation by flying away. No photographs taken.]

Darters: Anhingidae

ANHINGA, *Anhinga anhinga* (Linnaeus)

SPECIES ACCOUNT

Also known as American Anhinga, Water-turkey, Snakebird, and Darter. A large lean bird—cormorant-like but even slimmer—with spearlike yellowish bill; long, slender, limber neck; long, fan-shaped tail. *Male*: glossy black with extensive silvery etching on upperwing. *Female*: buffy brown from head to upper breast; rest of plumage essentially as in male. Length, 35 in.; wingspan, 3¾ ft.; weight, 3 lbs.

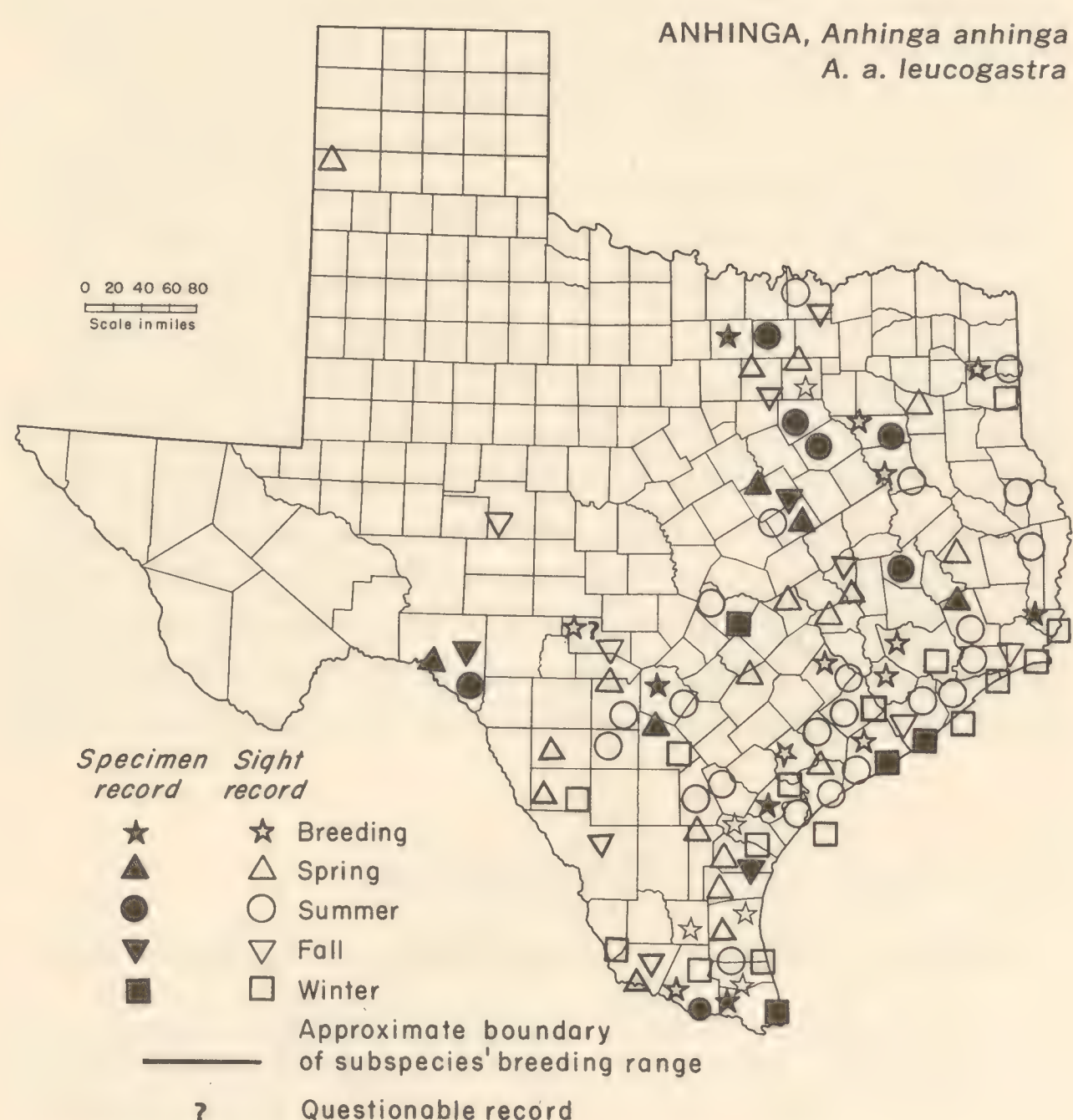
RANGE: S. Texas, w. Tennessee, s. Alabama, Florida, s. Georgia, and s. North Carolina, south through lowland Mexico, Central America, and South America to Ecuador, Brazil, and n. Argentina; also Cuba and Isle of Pines. Northern birds somewhat migratory.

TEXAS: (See map.) *Breeding:* Late Mar. to Aug. (eggs, Apr. 14 to July 27) from near sea level to—at least formerly—1,800 ft. Locally fairly common to scarce along coast and inland to Orange, Harris, Fort Bend, Colorado, Victoria, Brooks, and Hidalgo cos.; very irregularly uncommon to rare in small colonies elsewhere in eastern half, west to eastern edge of Edwards Plateau and north to Wise, Dallas, and Marion cos.; may have bred in Kerr Co. ("sometimes breeds," 1911, H. Lacey). Seems generally to be decreasing throughout breeding range, especially inland. *Dispersal:* Irregularly common—formerly very common—to rare wanderer, Mar. to Oct. (especially postnuptially) over breeding range and throughout south Texas west to Del Rio and north to Kerrville; accidental in Tom Green (South Concho Creek, near San Angelo, Sept. 19, 30, 1884, W. Lloyd), Pecos (Fort Stockton, fide Dresser, Jan., 1886, *Ibis*, 2d ser. 2:45), and Deaf Smith (May, 1939, H. F. Saunders) cos. *Winter:* Nov. to Mar. Locally and irregularly uncommon—formerly common—to rare along coast (most numerous on lower coast); casual inland in Hidalgo, Starr, Dimmit, Atascosa, Travis, Wharton, and Orange cos.; accidental in Harrison Co.

HAUNTS AND HABITS: The Anhingidae contains four, two, or one species according to the taxonomy followed. Members of this family resemble cormorants but are much trimmer and have straight, pointed, daggerlike bills. Subtler anatomical differences include a special trigger mechanism in the upper neck which

allows a darter to accurately control its beak when impaling fish prey. Anhingas swim in and fly over warm fresh water in continental tropical and warm temperate regions. Usual habitat is a wooded swamp or tree-fringed lake with waterlilies, lotus, and other aquatic vegetation. A snakebird's adherence to fresh water is marked—it is, in fact, the biggest landlubber in the order Pelicaniformes—but sometimes it appears on brackish or even salt water in migration and in winter. The presence of tall mangroves and absence of large cormorant populations—as at San Blas, Nayarit, Mexico—may counteract the American Anhinga's usual aversion to salt water.

Long neck outstretched and long tail sticking straight out behind, the Anhinga flies with regular, strong strokes interspersed with glides; a gliding individual greatly resembles a flying cross. Birds, singly or in groups, especially during migration and breeding seasons, soar to great heights on air thermals. During migrations in south Texas, for example at Santa Ana National Wildlife Refuge, Anhingas soar in their own flocks or with Turkey Vultures, Swainson's Hawks, and



White-necked Ravens. In the process of wheeling to gain altitude, individual Snakebirds fan their turkey-like tails, thus revealing the origin of the name Water-turkey. Though graceful on the wing, the Anhinga lifts off and alights with great difficulty; birds usually take wing from a perch. Since its feathers are not waterproof, it remains in water only long enough to feed. Otherwise, it perches on a waterside snag or tree limb—often with spread wings drying in the sun. When disturbed at its perch it prefers to drop iguana-like into the water, rather than fly off.

Like the cormorant, it sometimes swims with its body submerged so that its neck suggests a dead branch adrift; at this time the Snakebird's small head makes its neck appear snaky indeed. The Anhinga forages with quiet surface-dives. Underwater, it propels itself by paddling its totipalmate feet; wings are slightly expanded and the head darts forward in snakelike jerks. Instead of lightning pursuits, it usually stalks prey rather leisurely—swimming slowly underwater—or allows its victim to approach before stabbing it with its bill. The chiefly rough-fish diet includes sucker, mullet, sunfish, catfish, gizzard shad, others; occasionally an aquatic insect is taken.

Rapid chatterings, which sound like the clicking made by a treadle sewing machine, are the standard notes of the male and female Anhinga. A harsh *cruk-cruk* is also sounded. During the peak of nuptial display, the male utters a guttural call resembling that of an eastern Screech Owl.

CHANGES: As is almost universally true of large water birds, the Anhinga had its last good years in Texas during the 1920's and 1930's. Unlike most herons, egrets, and the Roseate Spoonbill, it has no sanctuary on Audubon-warden-patrolled coastal islands. The wooded lakes it requires for feeding, breeding, and drying its plumage are nowadays churned up by motor boats and otherwise highly disturbed. Many hundreds of livestock watering ponds have been built since 1930, but these are mostly too small to interest Water-turkeys except very occasionally during migration or dispersal. Likewise, the scores of artificial lakes that were constructed between 1935 and 1972 are large, wind-swept, and barren-shored—conditions unsuited for Anhingas. In freshwater areas along the Texas coast, the Cooperative Fish-eating Bird Survey, made during May and June of 1969, found 57 Anhingas on the upper coast, 17 on the central coast, and zero on the lower coast. Had a similarly comprehensive air and ground census been made thirty years ago, the count would very likely have been at least 90 percent higher. Clearly, the curious Snakebird is in trouble in the Lone Star State.

DETAILED ACCOUNT: TWO SUBSPECIES

FLORIDA ANHINGA, *Anhinga anhinga leucogastra* (Vieillot)

A. a. leucogaster of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Upper and lower surface glossy olivaceous

black, tail with numerous transverse corrugations; feathers of hindneck in part lengthened; crown, sides and back of neck ornamented with long hairlike plumes of hair brown; upper back with oblong spots of white; tail and wings black, subterminal band of tail fuscous, paling terminally to brownish white; greater and median wing-coverts and large roundish spots on lesser wing-coverts, together with conspicuous shaft streaks, tertials, and scapulars, pale grayish white; lining of wing black with faint greenish gloss. Maxilla dull olivaceous, its edges and most of mandible yellow, edges and tip of latter with greenish tinge; bare space below eye bluish green; lores and bare space above eye dull yellowish green; gular sac bright orange but sometimes black; iris bright carmine; tarsus and toes anteriorly dull olive, posteriorly with webs yellow; claws brownish black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but lacking hair brown plumes of head and neck and manelike elongated feathers of hindneck. *Adult female, nuptial*: Acquired by partial prenuptial molt. Pileum and hindneck grayish fuscous; chin and throat dull pinkish buff, latter more or less mixed with brown; jugulum dull cinnamon buff and, below this, a band of bay on breast; remainder of plumage like nuptial adult male. Maxilla brown; mandible and gular sac dull orange; iris dark brown, yellowish, or pink; legs and feet dull orange brown. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, second winter*: Acquired by complete postnuptial molt from first nuptial. Similar to adult male in winter, but head and neck with some fuscous feathers among black ones. *Male, first nuptial*: Acquired by partial prenuptial molt from first winter. Similar to second nuptial adult male, but differs in having almost no transverse corrugations on tail; head, neck, and jugulum light brown and buff, much as in adult female; abdomen with admixture of fuscous; upper parts with fewer silver gray feathers. *Male, first winter*: Acquired by complete postjuvenile molt. Hindneck grayish hair brown, more or less mixed with pale gray; back chae-tura drab; rump dull glossy olivaceous black; wings and tail fuscous black; greater and lesser wing-coverts and numerous spots on fuscous lesser coverts dull grayish white, tertials and scapulars with broad grayish white shaft streaks; foreneck like that of female but rather more grayish; abdomen fuscous black mixed with fuscous; lining of wing fuscous black; gular sac yellow, edged with fuscous. *Female, second winter*: Acquired by complete postnuptial molt. Practically identical with adult female. *Female, first nuptial*: Acquired by partial prenuptial molt. Like first nuptial male. *Female, first winter*: Acquired by complete postjuvenile molt. Like first winter male. *Juvenal*: Acquired by postnatal growth. Buff; of thick down. *Natal*: None. Skin of naked young yellowish buff. Bill and iris blackish; legs and feet much like body color.

MEASUREMENTS: *Adult male*: Wing, 315.0–350.0 (average, 329.9) mm.; tail, 230.1–275.1 (247.6); bill (exposed culmen), 77.0–89.4 (82.3); height of bill at base, 14.0–16.0 (15.2); tarsus, 39.1–42.9 (40.9); middle toe without claw, 59.9–68.1 (62.7). *Adult female*: Wing, 310.1–340.1 (324.6); tail, 230.1–248.9 (242.1); bill, 71.9–82.0 (78.5); height of bill, 14.0–16.0 (15.0); tarsus, 38.6–42.4 (39.9); middle toe, 57.9–65.5 (61.0).

RANGE: Locally from s.e. Oklahoma to North Carolina, south through Gulf states and lowlands of e. Mexico and Central America to Colombia; also Cuba and Isle of Pines. Winters from s. Texas and South Carolina southward.

TEXAS: *Breeding*: Collected north to Wise (eggs), east to Orange (eggs), south to Refugio (eggs), Cameron, and Hidalgo, west to Bexar (eggs) cos. *Dispersal*: Collected in Val Verde Co. (3 specimens). *Winter*: Taken along and near coast in Brazoria, Matagorda, and Cameron cos.; one inland specimen: Travis Co. (Dec., 1901, J. A. Singley).

NESTING: *Nest*: In swamps and marshes or on borders of lakes; in bush or low tree over water; loosely built platform of large and small sticks, leaves, and moss; lined with leaves, sometimes green cactus thorns and Spanishmoss. *Eggs*: 2–5, usually 4; ovate or elongate ovate to elliptical ovate; bluish white or greenish white with chalky deposit; unmarked but sometimes nest stained; average size, 52.6 × 35.1 mm.

WESTERN ANHINGA, *Anhinga anhinga minima* van Rossem

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male and female, nuptial plumage*: Like *A. a. leucogastra* but smaller.

MEASUREMENTS: *Adult male*: Wing, 294.9–323.1 (average, 308.8) mm.; tail, 217.9–240.0 (228.9); bill (exposed culmen), 66.0–77.0 (71.9); height of bill at base, 14.0–15.0 (14.5); tarsus, 38.1–41.4 (39.6); middle toe without claw, 56.4–63.0 (58.9). *Adult female*: Wing, 299.0–318.0 (307.3); tail, (237.0);

bill, 66.5–71.1 (68.6); height of bill, 13.7–14.2 (14.0); tarsus, (40.4); middle toe, 54.6–57.9 (56.1).

RANGE: Sinaloa, south through lowlands of w. Mexico to Guatemala and El Salvador. Accidental in s.e. California, s.w. Arizona, and s.w. Texas.

TEXAS: *Accidental*: One specimen: Val Verde Co., Langtry (1 shot from flock of 5 by D. Coleman, Sept. 17, 1905; transported by W. H. Dodd to U.S. Biological Surveys collection, Washington, D.C.).

Frigatebirds: Fregatidae

MAGNIFICENT FRIGATEBIRD, *Fregata magnificens* Mathews

SPECIES ACCOUNT

Magnificent Man-o'-war Bird of numerous authors. A large, very aerial sea bird with extremely long, narrow, pointed wings; long (17 in.), forked tail (although tines usually closed); long (4¼ in.), thin, hook-tipped, pale gray bill. *Male*: all black; in display inflates scarlet gular sac. *Female*: blackish with white breast. *Immature*: blackish with white head, neck, and most of under parts. Length, 40 in.; wingspan, 7½ ft.; weight, 3½ lbs. Females average somewhat larger than figures given—e.g., wingspan up to 8 ft.

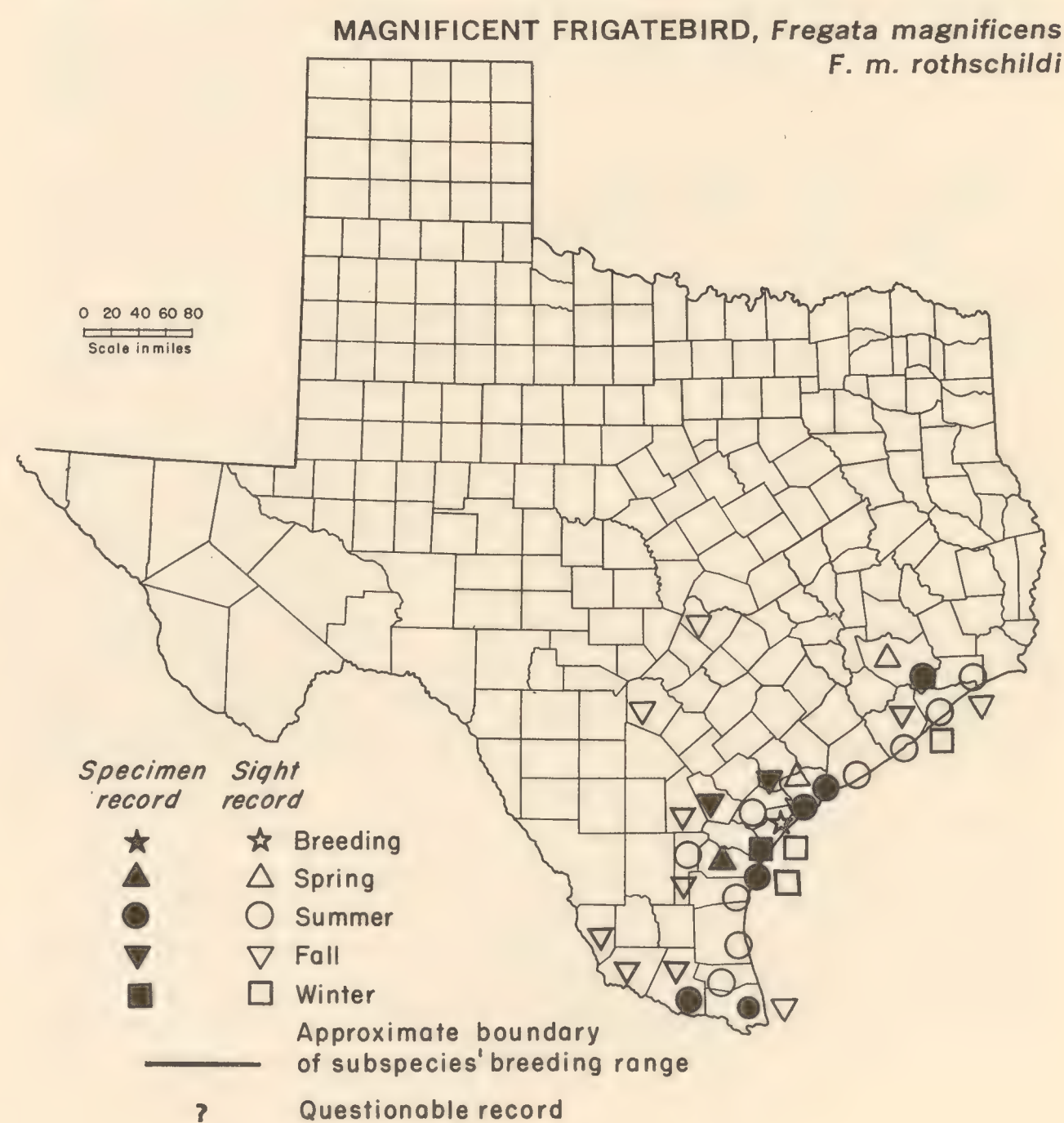
RANGE: Florida's Marquesas Keys (nesting, 1969), Bahamas, West Indies, coasts and many offshore islets of Mexico (including Baja California), Central America, and n. South America (Ecuador to e. Brazil), also Galápagos Islands; in Old World, Cape Verde Islands off west coast of Africa. Disperses widely, mainly between June and Sept.; in the United States, occurs along Pacific (occasionally to n. California) and regularly to Gulf of Mexico and s.e. Atlantic coasts.

TEXAS: (See map.) *Breeding*: One record: Aransas Co., Ship Island, near Second Chain-of-Islands (a number of eggs found laid on tops of wild currant vines, June 6, 1931, J. J. Carroll). *Dispersal*: Early Apr. to early Oct. (extremes: Mar. 12, Nov. 15). Uncommon, occasionally fairly common, to scarce from Chambers Co.—rarely from Jefferson Co.—south to mouth of Rio Grande; rare (chiefly in fall) over lakes and rivers inland within 50 mi. of coast. Presence, especially inland, often associated with hurricanes. *Winter*: Recorded only five times: Galveston Co., Seabrook (3 seen, Dec. 23, 1950, fide G. G. Williams); Aransas Co., Rockport, (20 seen, Dec. 17, 1940, Connie Hagar; Jan. 9, 1950, fide Williams); San Patricio Co., Welder Wildlife Refuge (see detailed account); Nueces Co., Mustang Island (1 seen, Jan. 30, 31, 1969, Kay McCracken). *Vagrant*: Casual with or just after tropical storms: San Antonio (3 seen, Sept. 12, 1961, Hurricane Carla, Mr. and Mrs. G. B. Harding; 9 seen, Sept. 21, 22, 1967, Hurricane Beulah, Hardings, et al.), and Austin (5 seen, Sept. 12–14, 1961, Hurricane Carla, G. F. Oatman, Jr., J. L. Rowlett, Rose A. Rowlett, Marie Webster, et al.). One sighting at Austin, apparently not related to weather factors (1 female, Sept. 23, 1968, Mary Anne McClendon). One specimen from Nacogdoches Co. (bird shot from t.v. antenna, ca. 1958, fur-

ther details lacking, fide C. D. Fisher; skin in Stephen F. Austin University collection).

HAUNTS AND HABITS: The Magnificent Frigatebird is the only one of the five species of pantropical Fregatidae—great, hook-beaked, crook-winged, black, vulturine birds all—which wanders regularly to North American shores. Here its presence in greatest numbers coincides with the hurricane season, as set forth in the old Texas folk rhyme: "June too soon, July stand by, August look out you must, September remember, October all over." *Fregata magnificens* is by a small margin the largest of its family; this species has the most wing surface, in proportion to body weight, of any bird. Although the Fregatidae spend most of their lives soaring and floating in the air above warm sea water, the Magnificent Man-o'-War and its relatives are not true pelagics; they seldom range far from sight of coasts.

Breeding stations for the present species are mainly on coastal—and a few oceanic—islands where growths of mangroves or similar vegetation provide an intertwining, more or less flat canopy; rarely it nests on barren islets. The nest, placed generally atop a tree, is a frail structure of sticks (usually of pencil diameter) about five to fifteen feet from the ground. This colo-



nial-nesting bird often shares its tree or bush roosts with Red-footed Boobies or Olivaceous Cormorants—sometimes the same individuals that it has robbed of fish catches during the day. The Magnificent Frigatebird is a resident species. Wanderers are predominantly pre- and nonbreeding individuals.

Although a frigatebird mostly soars, its strokes are deep and strong when it does flap. The long scissor tail does not always show its fork. To fish, a bird flies low over the water, drops its head, and snatches prey with its bill on or near the surface; all this is done in one continuous smooth motion. At times, the bill and head immerse, but wings and body virtually never. A breeze and choppy water improve fishing. Fish are also caught in mid-air. Flying fish are chief food; menhaden, sea catfish, weakfish, and mullet, also squid, jellyfish, and other plankton life are consumed. Frigatebirds frequently harass boobies, cormorants, gulls, and Brown Pelicans and easily persuade them to disgorge their catches. Flying Man-o'-Wars also patrol beaches; from the sand they deftly pluck fish, alive or dead, washed in by surf. Other individuals join Black Vultures in cleaning up meat scraps from slaughter houses. Birds sometimes follow tropical rivers inland to fresh water where they drink and, like giant swallows, take splash-baths as they fly along near the water. Ordinarily, frigatebirds do not swim; their feathers apparently become quickly soaked, and it is difficult, if not impossible, for a waterlogged bird to take flight.

The Magnificent Frigatebird is generally silent on the wing. At breeding stations birds utter various cackles, mutterings, whistles, and whines. Angry or hostile individuals sometimes rattle their mandibles. The male's scarlet throat pouch is inflated, sometimes as big as a man's head, at intervals during the preincubation period—even at night or when he is on the wing. It is not known whether or not the balloon serves as a resonance chamber for certain of his nuptial and territorial vocalizations.

CHANGES: For more than a century, books on North American birds have repeatedly stated that the Magnificent Frigatebird does not breed in the United States. Great was the astonishment among bird watchers, therefore, when photographs taken at Marquesas Keys, Florida, on August 7, 1969, by J. C. Ogden, Alexander Sprunt IV, and P. W. Sykes, Jr., revealed well-grown, healthy nestlings of *Fregata magnificens*. These pictures, four of which were published in October, 1969, offer conclusive proof that this species has bred in Florida (see *Audubon Field Notes* 23: 653, 654, also front cover).

An earlier nesting discovered on Ship Island near Second Chain-of-Islands, Texas, on June 6, 1931, by J. J. Carroll is reported in print for the first time in the present book. Since it is not known whether the Texas eggs hatched, it appears that, so far as the published record goes, the recent Florida nesting was the most successful one in U.S. history.

Considering the thinning effects of chlorinated hydrocarbons on eggshells, it remains a mystery why the frigates—whose eggs are naturally very fragile—nested

successfully in polluted 1969 but apparently never did in the pristine years of the nineteenth century.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN MAGNIFICENT FRIGATEBIRD, *Fregata magnificens rothschildi* Mathews

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts black with bluish, greenish, or violet sheen; elongated plumelike feathers of back dark hyssop violet; inner webs of outer tail feathers and of inner secondaries fuscous, becoming white on basal portion of inner webs of rectrices; lower surface fuscous black with violet sheen; lining of wing chaetura black with greenish or bluish sheen. Bill light blue, becoming white medially; inside of mouth carmine; gular sac orange to scarlet; iris dark brown or brownish black; bare space about eye purplish blue; legs and feet light carmine above, feet orange below. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male, but gular sac flesh color; bill dull gray with black tip; feet black. *Adult female, nuptial:* Acquired by wear from winter. Upper parts, including wings and tail, chaetura black, with little or no metallic sheen; most of lesser wing-coverts with broad fuscous to light fuscous margins; throat and jugulum fuscous; breast and upper abdomen white; abdomen and crissum fuscous black; outer tail feathers with white bases. Bill as in nuptial adult male; iris dark brown; orbital region and gular sac dark plumbeous; feet carmine. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, second nuptial:* Acquired by wear from second winter. Similar to nuptial adult male, but upper parts much duller, more brownish, with little or no metallic sheen; lower surface, with head and neck, mixed dark brown and white; outer tail feathers shorter. *Male, second winter:* Acquired by complete postnuptial molt from first nuptial. Much like second nuptial. *Male, first nuptial:* Acquired by wear from first winter. Similar to adult female, but whole head, neck, and lower surface, except brown flanks, white, though head and neck sometimes mixed with duller brown feathers; tail with very much shorter outermost rectrices. Bill horn color, darker at base; iris dull dark blue; legs and feet pale blue. *Male, first winter:* Acquired by complete postjuvenile molt. Like first nuptial. *Female, second nuptial:* Acquired by wear from second winter. Similar to adult female, but head and neck mixed white and dark brown; breast and sides white. *Female, second winter:* Acquired by complete postnuptial molt from first nuptial. Like second nuptial. *Female, first nuptial:* Acquired by wear from first winter. Like first nuptial male. *Female, first winter:* Acquired by complete postjuvenile molt. Like first winter male. *Juvenal:* Acquired by postnatal growth. White; of rather thick down. Bill pale grayish blue, becoming pinkish lavender at tip; iris brown; eye-ring pale grayish blue. *Natal:* None. Bird hatched naked.

MEASUREMENTS: *Adult male:* Wing, 582.9–631.0 (average, 606.8) mm.; tail, 349.0–463.0 (431.3); bill (exposed culmen), 102.1–111.5 (107.7); height of bill at base, 24.9–31.5 (29.2); tarsus, 21.1–23.9 (22.9); middle toe without claw, 51.1–57.4 (54.8). *Adult female:* Wing, 572.0–641.1 (617.7); tail, 370.1–477.0 (428.0); bill, 102.6–127.0 (116.1); height of bill, 26.4–32.5 (30.7); tarsus, 21.1–23.9 (22.6); middle toe, 53.6–58.9 (56.1).

RANGE: One Texas and one Florida nesting recorded. Both coasts of Mexico and Central America to coasts and islands of Colombia and Venezuela; also West Indies. Wanders, chiefly in postnuptial season, north to California and Oregon (casually) and U.S. Gulf coast and North Carolina.

TEXAS: *Dispersal:* Collected along and near coast northeast to Harris, southwest to Victoria, Bee, Aransas, Cameron, and Hidalgo cos. *Winter:* One specimen: San Patricio Co., Welder Wildlife Refuge (Feb. 10, 1960, C. Cottam). *Vagrant:* One specimen from Nacogdoches Co. (see species account).

NESTING: *Nest:* On sea islands; atop bushes, trees, or rocks, usually in colonies; loose platform of sticks, leaves, and weed stalks; lined with straw and grass. *Eggs:* Only 1; elliptical ovate; dull white; unmarked; average size, 68.3 × 46.5 mm.

Hérons and Egrets: Ardeidae

GREAT WHITE HERON, *Ardea occidentalis* Audubon

SPECIES ACCOUNT

In general size and shape closely resembles Great Blue Heron, but is all-white-feathered with yellowish bill and greenish yellow legs. Great White has a more massive bill and shorter occipital plumes than Great Blue (compare detailed measurements). Greenish yellow legs and feet of present species quite different from black legs and feet of smaller Common Egret. Length, 46¾ in.; height, 4 ft.; wingspan, 6¼ ft.; weight, 7¼ lbs.

RANGE: Key West to Florida Bay, Cuba and Isle of Pines; also—although reports of breeding lacking—on coasts of Yucatán, Quintana Roo, and Isla Cozumel. Wanders somewhat during postbreeding season; in the United States, dispersal usually confined to Florida, rarely north of Tampa Bay and Fort Pierce.

TEXAS: *Dispersal:* Casual along coast: Orange Co., mouth of Sabine River (fide L. R. Wolfe); Galveston Co., Galveston Island (1 immature, Jan. 17–Feb. 27, 1965, Mr. and Mrs. J. B. Strickling, et al., photographed by M. E. Isleib; 1 subadult, Jan. 8–Feb., 1972, Fred Collins, et al., photographed in color by J. L. Tveten and G. F. Oatman, Jr., Tveten's picture is no. 21 in Texas Photo-Record File, Texas A&M University); Aransas Co., Rockport (1 seen on each of following dates: Feb. 11, 13, and Oct. 25, 1936; Dec. 26 or 27, 1949, Connie Hagar); Jim Wells Co., Alice (1 subadult, Jan., 1966, R. O. Albert, G. W. Blacklock, Doris McGuire, et al.); Nueces Co., Corpus Christi (1 seen, Apr. 17, 1946, F. M. Packard); Cameron Co. (3 seen at Santa Clara Point, southern Laguna Madre and followed to heronry on Three Islands group, Aug. 5, 1933, H. C. Blanchard; 1 seen on Green Island, July, 1936, J. O. Larson).

HAUNTS AND HABITS: The Great White is among the largest and most majestic of the world's fifty-nine heron species. Often cited as the largest North American member of its family, it is actually the same size as Ward's Great Blue Heron of the Gulf states. Rather strangely, in view of their close relationship, *Ardea herodias* is the most widespread of the strictly Western Hemisphere herons and *Ardea occidentalis* is the most restricted. After more than a century of debate, ornithologists have still not agreed whether the Great

White is a separate species or a color phase of the Great Blue.

Within its small range, the Great White leads a rather sedentary life on mangrove-tangled keys and banks of shallow bays and lagoons, often growing with marl-turtle grass (*Thalassia*). The nest, a hollow in a bulky platform of large sticks lined with finer material, is typically constructed in the top of a low tree; old nests are often renovated and reused. Birds disperse, often northward, during the nonbreeding season—only at this time are they likely to be seen any distance from coasts.

Most observers find no differences of consequence in the behavior of America's two great herons. The Great White, like the Great Blue, is sedate and deliberate in both flight and feeding operations. It forages by day or night, depending on tidal and weather conditions. In Florida, *A. occidentalis* eats mainly saltwater fish (toadfish, pipefish, porcupine fish, mullet, porgy, and needlefish), shrimp, crabs, and other crustaceans, also gastropods.

Though rarely vocal, the Great White Heron sounds occasional rasping squawks and hoarse croaks. During courtship, birds *hoo* and gurgle and clap their bills; members of a pair greet one another with *arre-arre* calls.

DETAILED ACCOUNT

Following are plumage descriptions and measurements of *Ardea occidentalis occidentalis* of Florida, the form most likely to be encountered in Texas. Some authors recognize no races.

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Entire plumage pure white, with long jugular and pointed plumelike scapular feathers similar in shape to those of the Great Blue Heron, *Ardea herodias*; plumes of top of head also resembling those of Great Blue Heron but much shorter and broader at base, thus more triangular—the tip, however, long and pointed, not so attenuated and straplike. Bill gamboge yellow, mandible verging to dull green at base; bare skin of lores dull blue or yellowish green; orbital space light blue; iris bright yellow; thighs and posterior part of tarsus yellow, front of tarsus and tops of toes somewhat olivaceous, sides of both greenish yellow; claws light brown. At height of nuptial pairing, bill orange to scarlet; loreal area bright lime green; legs and feet scarlet. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but plumes of head, jugulum, and scapulars not so well developed. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but scapular, pectoral, and coronal plumes not so fully developed. *Second winter:* Acquired by complete postnuptial molt. Similar to



PLATE 2: male Gadwall, *Chaulelasmus streperus* (left), male American Widgeon, *Mareca americana* (right)

adults in winter, but plumes less fully developed. *First nuptial*: Acquired by wear from first winter. Similar to second nuptial male and female but without scapular and jugular plumes; crown plumes so short as to be practically absent. *First winter*: Virtually same as first nuptial; actually juvenal plumage continuously worn. *Juvenal*: Acquired by complete postnatal molt. Similar to first nuptial, but feathers somewhat more fluffy or downy and, as in that stage, plumes of scapulars and jugulum lacking, lengthened feathers of crown practically so. Bill yellow, but tip dull brown, and maxilla blackish briefly; iris yellow; feet dull green.

MEASUREMENTS: *Adult male*: Wing, 504.0–516.1 (average, 506.7) mm.; tail, 179.1–190.0 (183.9); bill (exposed culmen), 163.1–172.0 (168.7); height of bill at base, 32.5–35.1 (33.5); tarsus, 228.1–235.0 (232.1); middle toe without claw, 121.9–128.0 (126.7); occipital plumes, 53.1–192.0 (109.0). *Adult female*: Wing, 446.0–485.1 (471.9); tail, 158.0–169.9 (165.9); bill, 134.6–156.4 (149.1); height of bill, 28.9–34.0 (30.7); tarsus, 175.0–214.1 (198.1); middle toe, 105.9–124.0 (114.3); occipital plumes, 54.1–140.0 (87.9).

GREAT BLUE HERON, *Ardea herodias* Linnaeus

SPECIES ACCOUNT

A very large, long-necked, lanky marsh bird with daggerlike yellowish bill; long, dull blackish olive legs. Whitish head (in nuptial dress, acquires a few long—up to 9 in.—black occipital plumes); light gray or pale cinnamon neck; bluish gray on rest of upper parts; white-streaked black breast and belly. Length, 46½ in.; height, 4 ft.; wingspan, 6 ft.; weight, 6 lbs.

RANGE: Extreme s.e. Alaska and w. British Columbia to Nova Scotia, south through United States and Mexico (status on plateau undetermined) to Chiapas, Quintana Roo, and possibly Guatemala; also Galápagos Islands and Greater Antilles. Disperses in all directions following breeding season. Winters chiefly from w. British Columbia and Massachusetts to Panama and n. coastal Colombia and Venezuela; also Bermuda, Bahamas, and West Indies.

TEXAS: (See map.) *Resident* (as a species): Breeds, late Jan. to mid-Aug.—occasionally to late Aug. (eggs, Feb. 20 to June 17; young in nest, Mar. 23 to July 21) from near sea level to about 3,700 ft. Locally common—formerly very common—to uncommon throughout eastern half (most numerous along coast); locally common to scarce and irregular over western half. Tends to move southward for winter, when large concentrations may occur along coast; due to influx of birds breeding north of Texas, inland populations—even in the northern third—are only slightly reduced in winter.

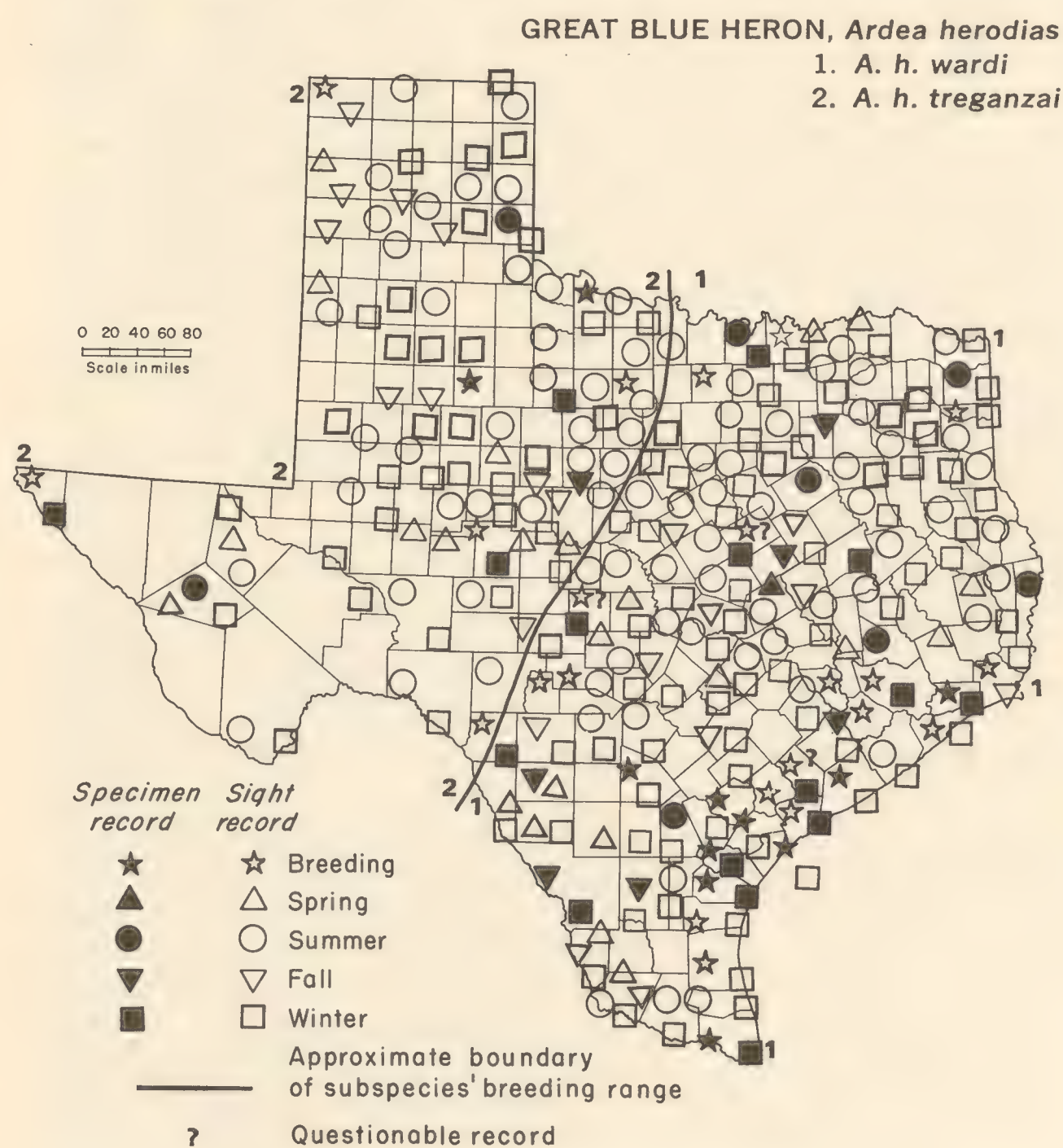
HAUNTS AND HABITS: Largest regular member of Ardeidae in Texas is the Great Blue Heron; this and the small Green Heron are the most likely members of their family to be observed inland. Of the strictly Western Hemisphere herons, *Ardea herodias* is the most widely distributed and occurs in both fresh and salt water, chiefly on the shallow edges of rivers, ponds, lakes, marshes, and bays, and sometimes at surf-edge. Diverse situations suffice for nesting: sea cliffs, spoil bank islands, mangroves, cactus-mesquite

brush, conifer or deciduous woodlands. Great Blue Herons—largely the young of the year—disperse in all directions following the breeding season; however, even during the nesting months, nonbreeders wander to areas where the species does not breed. Moving in fall from northern portions of the range, migrants travel singly or in small groups, usually by day, although nocturnal passage has been noted.

The Great Blue flies deliberately with deep slow wing-beats (usually 2 strokes per second). Normal air speeds are recorded at 19 and 29 m.p.h. In sustained flight, the neck is crooked in an S-shape—head drawn back to shoulders—and legs extended straight out behind. This heron's usual feeding method is to stand very still and wait for its victim to approach, whereupon the bird thrusts out its daggerlike bill for the seizure; on other occasions it stalks prey very slowly. Individuals also feed on shore, along road shoulders, and in dry fields. Its varied diet includes many fish (catfish, carp, pickerel, sunfish, killifish, yellow perch, rock bass, others); frogs, salamanders, lizards, snakes; shrimp, crayfish; grasshoppers, locusts, dragonflies, other insects; mice, rats, and pocket gophers.

When disturbed, the Great Blue croaks a harsh low-pitched *grak* or *kraak* or an even lower pitched *gruk* or *groh*. Otherwise, it is generally silent.

CHANGES: The Great Blue Heron has declined somewhat as a breeder in Texas, but habitat for migrant and wintering birds has increased. During the 1940's and 1950's, ranchers, sometimes aided by U.S. Soil Conservation Service subsidy, built many hundreds of livestock watering ponds and lakes in the semiarid western half of the state. During the cooler months, the artificial ponds are typically tended by one Great Blue Heron; the lakes, by from two to four, depending



on the extent of water surface. Normally no other heron species is present. Lakes on large ranches far removed from cotton fields are the freest from wind-drifted pesticides.

As reported by G. W. Blacklock and H. H. Hildebrand, the Cooperative Fish-eating Bird Survey for 1969 counted 575 Great Blue Herons on the upper Texas coast, 3,400 on the central coast, and 300 on the lower coast.

DETAILED ACCOUNT: THREE SUBSPECIES

EASTERN GREAT BLUE HERON, *Ardea herodias herodias* Linnaeus

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Sides of crown and long occipital crest black; forehead, center of crown, malar region, chin, and middle of upper throat white; upper surface of body—including tail, tertials, innermost secondaries, and secondary wing-coverts—slate gray, the long plumelike feathers of back and scapulars paler and tail somewhat darker; primaries and remaining secondaries blackish slate or dull black; sides of head and neck and throat dark gray; middle line of foreneck streaked with black, white, and cinnamon rufous; jugulum medially white, laterally smoke gray, streaked broadly with black and narrowly with cinnamon, long pointed plumelike feathers terminally drab gray or whitish; tuft of feathers on each side of breast black, behind this a small patch of cinnamon rufous; sides and flanks slate gray; breast and abdomen black, broadly streaked with white; lower tail-coverts white; thighs and edge of wing cinnamon rufous; lining of wing slate color; axillars slate gray. Bill light orange-yellow or wax yellow; iris straw yellow, pinard yellow, apricot yellow, or chrome yellow; broad orbital space cobalt blue; back of bare thighs black to mars brown, maize yellow in front; tarsi and toes black in front, burnt umber behind; soles of toes dull maize yellow; claws black. At height of nuptial pairing, bill pinkish orange, but culmen brownish olive; lores and eyelids green; iris yellow; legs and feet pinkish orange. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults, but long plumes of jugulum, scapulars, and head not so fully developed. *Third nuptial:* Acquired by partial prenuptial molt. Like nuptial adults, but with at least a few white-marked feathers in black tufts on sides of breast; white crown with some dark brown markings. *Third winter:* Acquired by complete postnuptial molt. Like adults in winter, but with some white in black breast-tufts; a little dull brown on white crown. *Second nuptial:* Acquired by partial prenuptial molt. Similar to third nuptial, but plumes not so fully developed; more black on pileum; more white mixture in black breast-tufts; lower surface duller. *Second winter:* Acquired by complete postnuptial molt. Resembling third winter, but occipital plumes fewer and shorter, those on scapulars and jugulum fewer and less well developed; crown black; forehead only partly white; back breast-tufts much mixed with white; thighs and lower parts duller. *First nuptial:* Acquired by partial prenuptial molt. Similar to juvenal or first winter, but with a few occipital plumes and some short plumes on jugulum and scapulars; buff edgings of wing-coverts mostly absent by wear; lower parts brighter. Maxilla burnt umber, darker on base of culmen, but tip and terminal part of mandible light chrome; remainder of mandible martius yellow; iris apricot yellow; bare part of thighs martius yellow; tarsi and toes warm sepia; soles of toes cream color; claws slate black. *First winter:* Acquired by wear from juvenal and worn through winter with practically no change. *Juvenal:* Acquired by complete postnatal molt. Pileum and upper part of sides of head brownish black without plumes; entire neck mixed with buff, ochraceous tawny, and drab; upper surface much more brownish than in adult and without long narrow plumes; wing-coverts tipped or spotted with ochraceous or tawny; edge of wing paler and more mixed with white; foreneck streaked with black and cinnamon rufous; breast and abdomen white, streaked broadly with gray and slate

color and more or less mixed with cinnamon rufous or buff; thighs cinnamon; jugulum plumes wanting. Maxilla black or blackish brown; mandible umber yellow to pale pea green; iris gamboge yellow; eyelids and bare lores olive yellow to light apple green, bare part of thighs and soles of toes dull straw yellow or apple green, remaining parts of feet black. *Natal* (this plumage of this race not seen in Texas): Head light olive gray; back mouse gray; flanks and abdomen white or cream white; throat naked.

MEASUREMENTS: *Adult male:* Wing, 440.9–480.1 (average, 465.1) mm.; tail, 167.1–188.0 (178.3); bill (exposed culmen), 123.0–151.1 (139.7); height of bill at base, 23.6–31.5 (27.9); tarsus, 162.1–205.0 (180.8); middle toe without claw, 93.0–114.6 (103.4). *Adult female:* Wing, 433.1–470.9 (454.2); tail, 159.0–183.9 (174.3); bill, 127.0–146.0 (136.9); height of bill, 24.4–28.4 (26.7); tarsus, 156.9–194.1 (175.8); middle toe, 93.0–115.1 (102.4).

RANGE: S.e. British Columbia and n. Alberta to n. Nova Scotia, south to s. Nebraska and n. South Carolina. Winters from w. Montana (casually), s. Illinois, and Maine through United States, Mexico, and Central America (locally) to Colombia and Venezuela; also Cuba, Jamaica, Dominican Republic, and Bermuda.

TEXAS: *Winter:* Taken north to Cooke, east to Harris, south to Jackson and Cameron (Mar. 21), west to Zavala (Nov. 6) and Mason cos. Uncommon.

WARD'S GREAT BLUE HERON, *Ardea herodias wardi* Ridgway

DESCRIPTION: *Adults, nuptial plumage:* Similar to *A. h. herodias* but decidedly larger; upper surface and neck paler. *Natal:* Probably similar to *A. h. herodias*.

MEASUREMENTS: *Adult male:* Wing, 485.9–517.9 (average, 497.8) mm.; tail, 181.1–209.0 (191.5); bill (exposed culmen), 146.0–167.1 (156.7); height of bill at base, 28.4–32.0 (30.7); tarsus, 195.1–231.9 (210.8); middle toe without claw, 115.1–129.0 (119.6); occipital plumes, 91.1–230.1 (181.1). *Adult female:* Wing, 470.9–489.0 (477.3); tail, 173.0–192.0 (181.6); bill, 140.0–147.1 (143.8); height of bill, 26.9–30.5 (28.2); tarsus, 189.0–214.1 (205.2); middle toe, 111.0–123.0 (116.3); occipital plumes, 89.9–208.0 (153.9).

RANGE: Kansas to s.e. South Carolina, south to s. Texas and s. Florida. Winters from e. Texas to s. Florida.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 1,800 ft. Collected north to Navarro and Cass, east to Newton and Chambers (eggs), south to Aransas, Nueces, and Cameron, west to Webb cos. Locally fairly common.

NESTING: *Nest:* In forests or marshes or on flat coastal islands; in tree, bush, yucca, cactus, duck blind, channel marker, or on ground; bulky and composed of sticks, grass, weeds, bits of cactus; lined with rootlets, twigs, and grass. *Eggs:* Usually 3–4; ovate or oval to elliptical ovate or fusiform; pale greenish blue, niagara green, or pale lichen green; unmarked; average size, 65.3 × 46.3 mm.

TREGANZA'S GREAT BLUE HERON, *Ardea herodias tregan-zai* Court

DESCRIPTION: *Adults, nuptial plumage:* Similar to *A. h. wardi* but smaller; like *A. h. herodias*, but upper parts and neck lighter in color; size slightly larger. *Natal:* Probably similar to *A. h. herodias*.

MEASUREMENTS: *Adult male:* Wing, 445.0–493.0 (average, 471.4) mm.; tail, 162.1–192.0 (179.8); bill (exposed culmen), 132.1–156.9 (144.3); height of bill at base, 25.9–31.0 (27.9); tarsus, 165.1–193.0 (181.8); middle toe without claw, 99.1–112.5 (105.6). *Adult female:* Wing, 439.9–475.0 (455.6); tail, 164.1–182.1 (174.3); bill, 120.4–150.1 (137.2); height of bill, 24.9–27.9 (26.2); tarsus, 156.9–183.1 (170.4); middle toe, 88.9–107.4 (100.8).

RANGE: C. Washington, Idaho, and Wyoming, south to n.e. Baja California, w. Sonora, Sinaloa, and w. Texas. Winters chiefly from s. Arizona and w. Texas to Colima, Hidalgo, and

Tamaulipas; rarely in northern portion of breeding range and on Texas Gulf coast.

TEXAS: *Breeding*: Altitudinal range, 900 to about 3,700 ft. Collected in Wilbarger, Kent (eggs), and El Paso (Feb. 27) cos. Locally fairly common to uncommon. *Winter*: Taken north to Cooke, east to Chambers, south to Cameron, west to Kinney and Jeff Davis (Aug. 12) cos. *Dispersal*: Two specimens: Live Oak Co. (bird banded at Lake Bowdoin, Montana, taken June 1, 1934, E. F. Ranze; another banded at same place, taken July 15, 1935, C. M. Johnson).

NESTING: *Nest*: Usually in canyons of rivers or streams; often in colonies; chiefly on ledge of cliff, or in bush or tree (especially cottonwood and mesquite), often a dead tree standing in water; bulky structure of coarse sticks; lined with fine twigs; sometimes 4-5 ft. in diameter. *Eggs*: Similar to those of *A. h. wardi*, but average size, 60.2 × 41.7 mm.

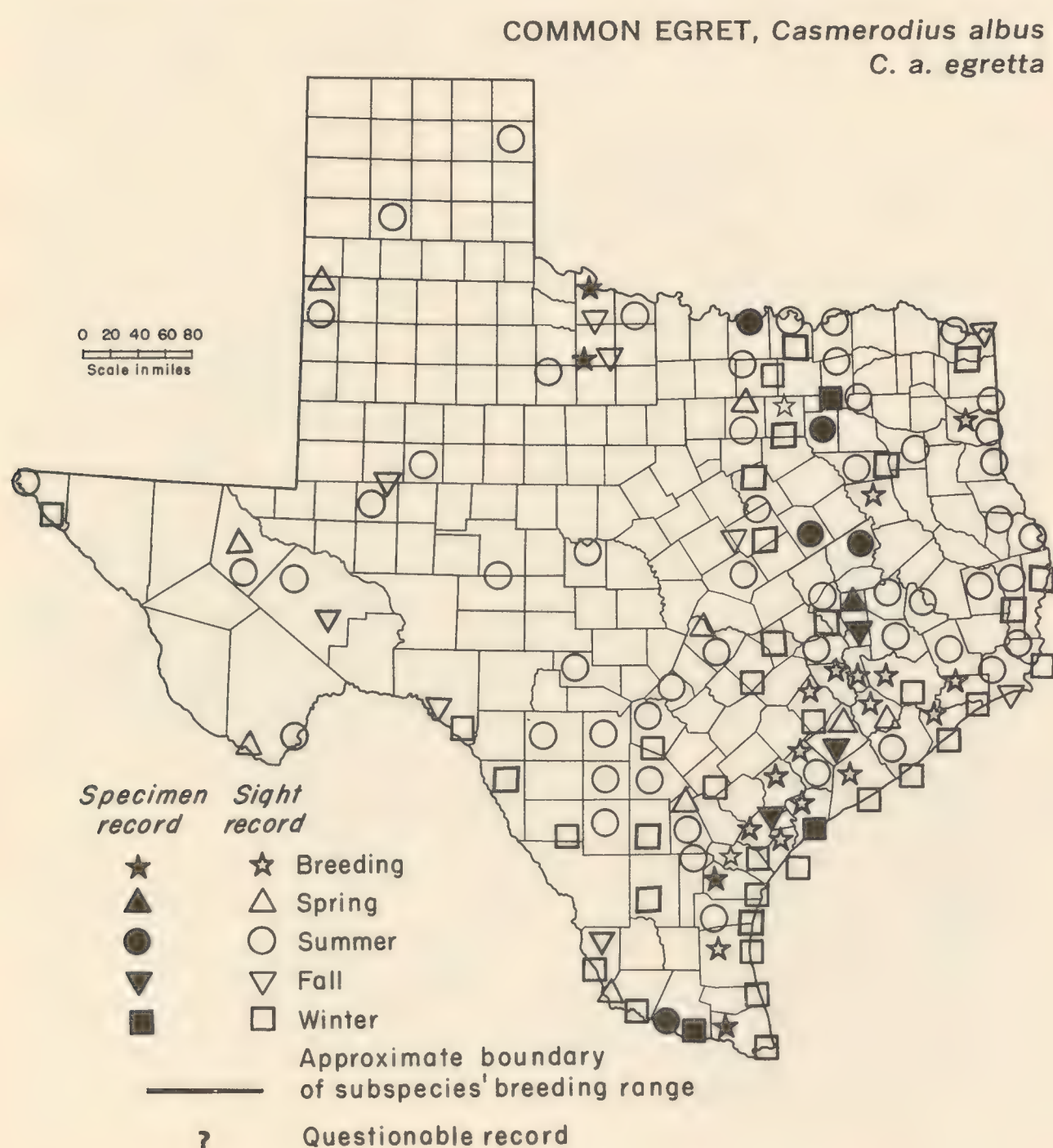
COMMON EGRET, *Casmerodius albus* (Linnaeus)

SPECIES ACCOUNT

American Egret, Egret, and Great Egret of various New World authors; in Old World, known as Great White Heron (British Handbook), Large Egret (B.O.U. check-list), and White Egret (Australia). A large white heron with daggerlike yellow bill; long black legs and feet. In nuptial dress, acquires long straight dorsal plumes that extend beyond tail; bill becomes orangish. Length, 38½ in.; wingspan, 4¾ ft.; weight, 2¼ lbs.

RANGE: Nearly cosmopolitan (all continents except Antarctica), but local, between lat. 50° N. and 55° S. Demonstrates extensive postbreeding dispersal; also known to wander at sea. In winter, largely vacates Europe, n. Africa, s. Russia, n. China, Manchuria, Sakhalin, and inland portions of United States.

TEXAS: (See map.) *Resident* (largely): Breeds, early



Mar. to late July—occasionally into early Aug. (eggs, Mar. 20 to June 23; young in nest, May 19 to Aug. 4) from near sea level to about 1,200 ft. Locally common—formerly very common—to uncommon and declining in rookeries on and near coast; very irregular inland in small colonies within eastern half (has bred in Wilbarger, Baylor, Dallas, Marion, Harrison, Anderson, Waller, Fort Bend, Austin, and Colorado cos.). *Dispersal*: Wanders regularly, especially postnuptially in summer and fall, over eastern half, where fairly common to scarce; irregularly uncommon to rare as a wanderer (same seasons) in western half. Tends to move southward for winter, though lingers in reduced numbers over whole of eastern half and usually remains common to fairly common on coast.

HAUNTS AND HABITS: The Common Egret, a near-cosmopolite, is most numerous in subtropical and tropical zones. Approaching the Great Blue Heron in stature, it is largest of the all-white Ardeidae commonly found in Texas. (The Great White Heron is restricted to extreme southern Florida with some casual dispersal in the South.) The present species feeds in rather open shallow waters, but for nesting requires woods or thickets where sturdy vegetation provides both nest support and sticks for material. Various swamp situations—mangrove, cypress, redcedar-bayberry-saltmyrtle, etc.—with salt, fresh, or brackish water are its haunts. In Texas, nest colonies are usually in *Scirpus* marshes or on mesquite-huisache-pricklypear-saltcedar coastal islands. As is usual with herons and egrets, pairs of this species nest singly or in large or small colonies often shared with other egrets, herons, ibises, Wood Stork, or Anhinga.

On the wing, the Common Egret is more graceful and buoyant than the Great Blue; flying speeds have been registered at 17 to 32 m.p.h. Most foraging is done in typical heron manner by standing patiently in shallows until aquatic animals approach, or by slowly stalking. Fishing Common Egrets can be recognized at a distance by their eager leaning stance: The bird erects its long neck and leans neck and body forward. When food is sighted, the egret quickly lashes out its dagger bill to seize it. Occasionally this heron alights in deep water to catch prey. *Casmerodius albus* feeds on an assortment of fish, frogs, salamanders, snakes, snails, crayfish, crickets, grasshoppers, moths, and dragonflies. Like the Great Blue Heron, this egret, especially at the onset of the breeding season, is very tense at the nest, and the slightest disruption by intruders is enough to flush a whole heronry.

When disturbed, the ordinarily silent Common Egret may utter a low-pitched croaking *cuk-cuk-cuk* or *frawnk*.

CHANGES: From the 1890's until 1919, plume hunters nearly extirpated the American Common Egret or "long white" as they sometimes called it. After World War I there was a great decline in demand for aigrettes used in decorating hats and dresses. During the 1920's and 1930's, this bird increased to something like its historic numbers—thousands in the wetter parts of Texas.

Then in 1939 began the war-stimulated industrial boom in coastal Texas that has continued into the 1970's. Of the forty Texas heronries with nesting *Casmerodius albus* discovered between 1877 and 1971, it is amazing that most of those situated on Gulf coast islands are still active (see Reddish Egret for a list of these rookery islands). Most mainland colonies have been developed out of existence. The Cooperative Fish-eating Bird Survey of 1969 found 3,562 Common Egrets on the upper Texas coast, 2,850 on the central coast, and 100 on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN COMMON EGRET, *Casmerodius albus egretta* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Entire plumage white with many long decomposed scapular plumes over back. Bill chrome yellow, sometimes tinged with green; bare skin of face apple green; iris naples yellow; legs and feet black. At height of nuptial pairing, bill orange; legs and feet glossy black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults but lacking long scapular plumes. *First nuptial:* Acquired by partial prenuptial molt. Like nuptial adults but with only a few scapular plumes. *First winter:* Same as juvenal which is worn throughout winter. *Juvenal:* Acquired by complete postnatal molt. Like first nuptial but without any plumes. Bill yellow, but tip of maxilla black; iris yellow; legs and feet black. *Natal:* White; bare skin of face, throat, and body light yellowish green. Bill and feet light green or dull yellow; iris pale yellow.

MEASUREMENTS: *Adult male:* Wing, 357.1–405.1 (average, 383.3) mm.; tail, 146.0–165.6 (155.4); bill (exposed culmen), 111.0–121.9 (117.3); height of bill at base, 19.0–22.6 (20.9); tarsus, 147.1–179.1 (163.8); middle toe without claw, 91.9–105.9 (99.2). *Adult female:* Wing, 345.9–389.1 (364.7); tail, 129.0–161.0 (144.0); bill, 99.1–121.4 (109.7); height of bill, 17.5–21.6 (19.8); tarsus, 130.0–161.5 (150.4); middle toe, 81.0–104.1 (91.9).

RANGE: C. Oregon and c. Oklahoma to s.e. New York, south through United States, Mexico, Central America, and South America to Patagonia; also West Indies. Winters from c. California, e. Texas, and North Carolina to Patagonia.

TEXAS: *Resident* (largely): Collected northwest to Wilbarger (eggs), east to Hunt, Grimes, and Calhoun, south to Cameron and Hidalgo cos. *Dispersal:* One specimen: Pecos Co., Fort Stockton (see Dresser, Jan., 1886, *Ibis*, 2d ser. 2:31).

NESTING: *Nest:* In marshes or wooded swamps, usually over water, or on small coastal islands; often in colonies; in trees or bushes, usually 4–20 ft. (sometimes only 1 ft.) above water or ground, loosely made platform of sticks, grasses, and rushes; lined with fine twigs, vines, and weed stems. *Eggs:* 2–5, usually 3–4; elliptical to oval; dull pale blue, pale greenish blue, or pale niagara green; unmarked; average size, 56.4 × 40.4 mm.

SNOWY EGRET, *Leucophoyx thula* (Molina)

SPECIES ACCOUNT

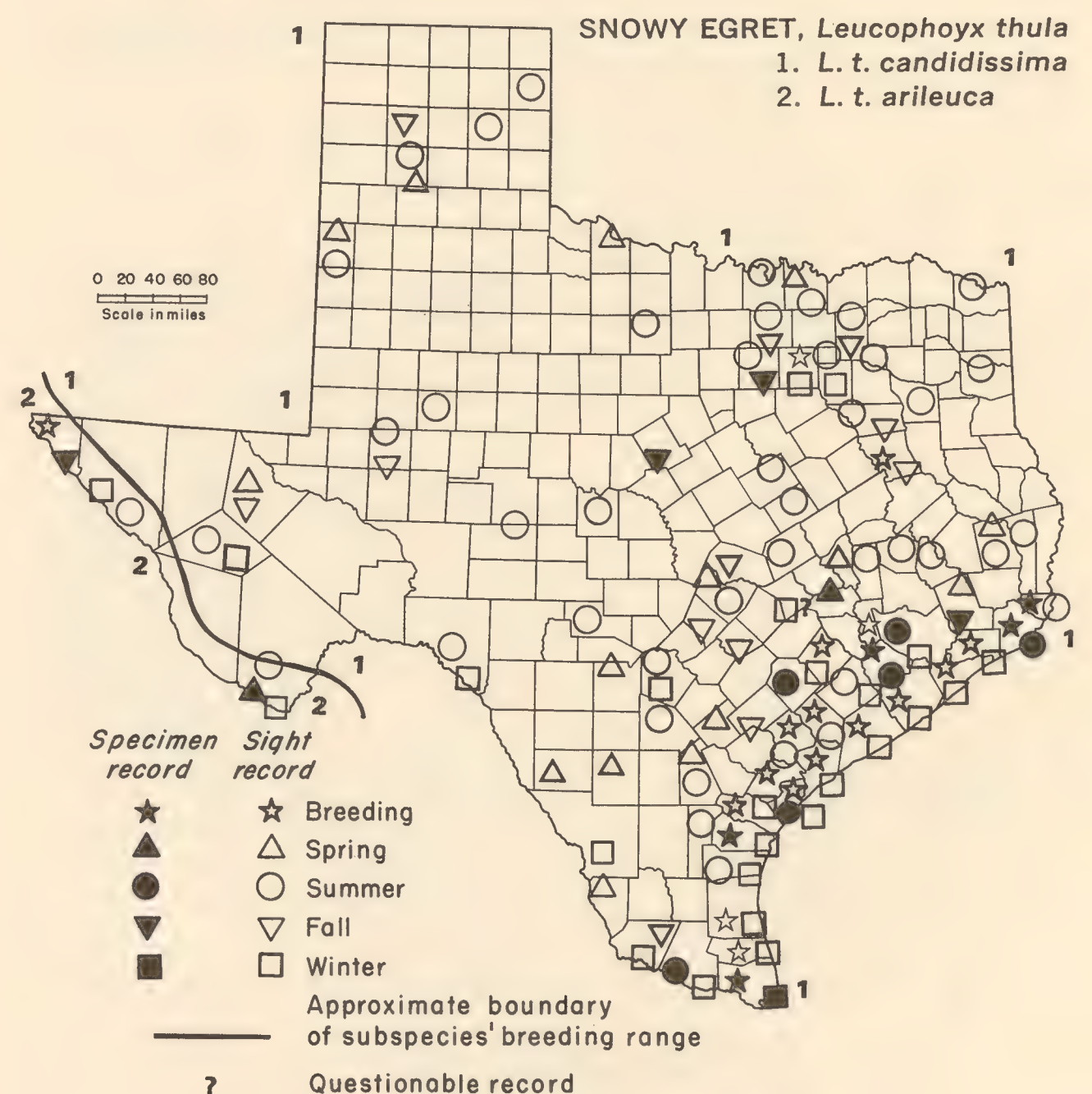
A rather small white heron with slender black bill; black legs; yellow feet ("golden slippers"). *Nuptial bird:* acquires white plumes on crown, nape, and lower foreneck, and long recurved scapular aigrettes; feet become orange briefly. *Immature:* has yellowish line up back of tarsus, giving each hind leg a yellow cast; thus,

bird could be mistaken for young greenish-legged, white-plumaged Little Blue Heron, but is told by its more slender, black (not two-toned) bill. Length, 23 in.; wingspan, 3¾ ft.; weight, 12¾ oz.

RANGE: Locally from c. California to Oklahoma, Texas, and Florida, and Atlantic coast from Long Island, thence from Baja California and mainland Mexico (chiefly coastally), south through Central America and South America to Chile and c. Argentina; also Tres Marias Islands (off west coast of Mexico), West Indies (though rare in Lesser Antilles), and Trinidad. Exhibits rather mild postbreeding dispersal. In winter, withdraws from most inland portions of U.S. range.

TEXAS: (See map.) *Resident* (largely): Breeds, late Mar. to Aug. (eggs, Apr. 17 to July 8; very small young, Apr. 23 to June 10; young in nests to July 6) from near sea level to about 500 ft.—formerly in El Paso Co. at 3,583 and 3,612 ft. Locally very common to fairly common, though decreasing, in colonies on and near the coast; very irregular in small colonies inland in eastern half north to Dallas (has bred inland in Dallas, Anderson, Waller, and Colorado cos.); Utah race formerly (1938, 1959) bred in El Paso Co. *Dispersal:* Wanders regularly, especially postnuptially, over most of eastern half, where fairly common to scarce; irregularly uncommon to rare as a wanderer in western half. Tends to move southward for winter, though usually remains common to uncommon on coast from vicinity of Chambers Co. south to mouth of Rio Grande.

HAUNTS AND HABITS: Snowy Egrets are found in fresh, brackish, or salt marshes. In the United States, western birds commonly inhabit tule-bordered ponds and lakes. Those east of the 100th meridian usually reside nearer coasts in habitats varying from salt marshes



and cedar swamps amid sand dunes in New Jersey, and tracts of mangrove-tropical buttonwood in Florida, to yucca-pricklypear-huisache-saltcedar islands on the Texas coast. Dispersal following the nesting season, though mild in comparison to that of some other herons, takes vagrants as far north as latitude 45° north; however, exceptionally far-traveling individuals have been recorded in Washington, Alberta, Nova Scotia, Newfoundland, and Bermuda. Most inland breeders move southward a short distance in winter; in the United States, chiefly to the Central Valley of California and the Gulf coast.

On the wing and in all its movements the Snowy is extremely light and graceful. Smaller than the Common Egret, its wing-beats are proportionately shorter and quicker. When pressed it can attain flight speeds of 30 m.p.h. Seemingly, no natural agent—neither muddy water, wave-splash, nor Texas-style dusty rain—can soil the immaculate purity of its white plumage. However, the carbon black factory located between Rockport and Aransas Pass, Texas, has proved too much: In this vicinity even some Snowies are soot begrimed. Although not so frenetic as the Reddish Egret, the Snowy is a very lively, dashing feeder. As it wades about in shallows, it usually quivers its golden slippers with each step; this agitation apparently serves to arouse its prey into visibility in murky water. Occasionally the Snowy hunts insects stirred up by cows in amateur Cattle Egret style. Standard foods are crayfish (especially favored), shrimp, and fiddler crabs; it also eats small fish, frogs, lizards, snakes, worms, snails, insects, and an occasional rodent.

At the beginning of the breeding season, the Snowy Egret is quite vocal. Territorial hostilities are usually accompanied by repetitious harsh *aahing* or *raahing*. A displaying male will point his bill skyward and pump his head up and down as he utters a loud *a-wah-wah-wah*.

CHANGES: By 1910, plume hunters had shot out most of the breeding colonies of Snowy Egrets in Texas and other parts of the United States. During the 1890's and early 1900's, the aigrettes of this and the American Common Egret had been "worth their weight in gold." The soft, delicately recurved plumes of the "short white" were especially favored for adorning hats, dresses, fans, etc. Since these lacelike feathers grow only on nuptial birds, a shoot at a heronry killed two generations at once: With no parent birds to shade them, eggs and chicks promptly baked to death in the hot sun. Fortunately fashion is fickle. By 1919, only ostrich and chicken feathers remained greatly in style, at least in the United States.

During the 1920's and 1930's, the Snowy Egret staged a rapid comeback. For example, at Eagle Lake (Colorado Co.), J. J. Carroll reported that on April 27, 1926, he found a nesting colony containing between 750 and 1,000 birds. The next year, April 2, 1927, he estimated twice as many Snowies at the same place. By April 25, 1933, the number of actual nests was

2,000; these were distributed in four well-defined rookeries in the bushes and trees located in the shallows of Eagle Lake. Then on April 4, 1935, Carroll discovered a new colony on a different edge of the lake which contained thousands of apparently breeding Snowy Egrets. Meanwhile, at the western tip of the state at Fabens (El Paso Co.), Mr. and Mrs. W. W. Wimberly found on May 30, 1938, a colony containing 200 occupied nests in a cottonwood grove near the Rio Grande.

However, recovery of the pure white little heron with the golden slippers was not to be complete. Starting in 1939, World War II stimulated the military-industrial complex throughout Texas, especially in and near the coastal rookeries. The resulting boom in people, construction, pesticides, and pollution has rocketed until 1970 put the Lone Star State number one in the nation for fish kills—a whopping 6.2 million fish were poisoned by factory waste and agricultural chemicals during that year.

In addition to having its fish food poisoned, *Leucophoyx thula* faces another possible threat: Since the late 1950's, increasingly scarce nest sites, and even nest sticks, are being used also by invading Cattle Egrets, which are able to stay healthy because they eat mostly grasshoppers from unsprayed cow pastures. In 1970, Jed J. Ramsey discovered that the Snowy Egrets in the rookery at Eagle Lake had been largely replaced by 2,000 nesting Cattle Egrets. That same year, 150 Snowy Egrets found in the mixed heronry on Rooke Ranch (Refugio Co.) were far outnumbered by Cattle Egrets which comprised 91 percent of the 6,582 birds present (D. K. Goering, Ronald Cherry, 1971, *Wilson Bulletin* 83: 303–305).

The El Paso County nesting group, reduced to 30 birds, was apparently last known to be active on May 9, 1959, when Roy Fisk discovered them at Tornillo. Disturbance by increasing numbers of people, rather than Cattle Egrets, was almost certainly the adverse factor there.

Forty rookeries containing Snowy Egrets have been discovered since the white man came to Texas. Most of the mainland colonies have either been developed out of existence or are producing very modest numbers of young Snowies. The heronries on small offshore islands (see Reddish Egret for listing of these) have fared somewhat better. The surrounding salt water offers some protection from mammalian and reptilian predators. National Audubon wardens reduce landings by fishermen and photographers. Development is usually not advanced on these low islands which are frequently awash in storm tides. Finally, the Snowy Egret is more inclined than the Cattle Egret to nest on a sea island, for during the labor of feeding young, the Snowy has its fish, shrimp, and crabs close at hand; an island-nesting Cattle Egret may have to fly many miles inland to catch enough grasshoppers and crickets to feed its young.

The 1969 Cooperative Fish-eating Bird Survey found

4,253 Snowy Egrets on the upper Texas coast, 3,525 on the central coast, and 300 on the lower coast.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN SNOWY EGRET, *Leucophoyx thula candidissima* (Gmelin)

Split from *L. t. thula* of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. All white, with long decomposed occipital, jugular, and scapular plumes, the last recurved at tips. Bill black, basal portion of mandible yellow or deep rose red; lores, iris, and eyelids yellow or orange-yellow; tibia, tarsus, and claws black; toes yellow. At height of nuptial pairing, bill glossy black; lores and eyelids light red; iris yellow; legs shiny black; feet orange. *Adults, winter:* Acquired by complete postnuptial molt. White like nuptial adults, but lack beautiful recurved dorsal plumes; others shorter and less curved. *First nuptial:* Acquired by partial prenuptial molt. Like nuptial adults, but with very short occipital, scapular, and jugular plumes. *First winter:* Juvenal plumage is worn during winter. *Juvenal:* Acquired by complete postnatal molt. Entirely white but with no occipital, scapular, or jugular plumes. Maxilla dull black, mandible pale neutral gray with black tip; base of maxilla, bare lores, and eyelids primuline yellow; iris ivory yellow; legs and feet at first olive; later, front of tarsus black; hind part light greenish yellow; lower end of tarsus with toes empire yellow to pinard yellow. *Natal:* White or buffy white; naked skin light green or cinnamon. Most of bill pinkish or pale cinnamon; iris grayish or pale yellow; feet light yellow, but dull green above.

MEASUREMENTS: *Adult male:* Wing, 237.0–263.1 (average, 250.0) mm.; tail, 83.1–95.5 (89.4); bill (exposed culmen), 76.5–86.6 (80.7); height of bill at base, 13.2–14.5 (14.0); tarsus, 95.0–109.5 (100.1); middle toe without claw, 56.9–62.0 (60.2). *Adult female:* Wing, 228.1–252.0 (238.0); tail, 82.0–94.0 (86.1); bill, 72.9–82.6 (78.0); height of bill, 13.0–14.7 (13.7); tarsus, 89.9–99.1 (94.0); middle toe, 55.6–62.5 (57.9).

RANGE: Maryland to Florida, and e. Oklahoma, e. Texas, Louisiana, and Mississippi, south locally through e. Mexico and Central America to n. Colombia and n. Venezuela; also Greater Antilles. Winters chiefly along or near coasts from South Carolina through breeding range to s.e. Brazil.

TEXAS: *Resident* (largely): Altitudinal breeding range, near sea level to 500 ft. Collected north to Washington, east to Orange (eggs), southwest to Aransas, Cameron, and Hidalgo cos. Locally common. *Dispersal:* Collected in Pecos (19th century), Comanche, and Tarrant cos.

NESTING: *Nest:* In mainland swamps or marshes or on coastal islands; often in colonies; in trees or bushes, usually 5–15 ft. above ground or water; rather light platform of twigs, reeds, or rushes; lined sometimes with fine twigs and rootlets. *Eggs:* 2–6, usually 4–5; elliptical or ovate to oval; pale bluish green, greenish blue, or pale niagara green to pale glaucous green; unmarked; average size, 42.9 × 32.3 mm.

UTAH SNOWY EGRET, *Leucophoyx thula arileuca* Oberholser, new subspecies (see Appendix A)

DESCRIPTION: *Adults, nuptial plumage:* Similar to *L. t. candidissima*, but wing longer; tail decidedly longer; tarsus longer; bill averaging slightly smaller. Similar to *L. t. brewsteri*, of w. United States and n.w. Mexico, but wing shorter; bill and tarsus much shorter; middle toe also shorter. Similar to *L. t. thula*, of c. and s. South America, but wing, tail, and bill longer; tarsus much longer.

MEASUREMENTS: *Adult male:* Wing, 252.0–273.0 (average, 262.9) mm.; tail, 91.9–103.1 (96.8); bill (exposed culmen), 74.9–86.6 (80.2); height of bill at base, 14.0–15.5 (14.7); tarsus, 97.1–112.0 (104.6); middle toe without claw, 55.1–64.0 (60.2). *Adult female:* Wing, 238.0–262.1 (249.7); tail, 85.1–102.1 (91.2); bill, 70.1–84.1 (78.5); height of bill, 13.0–14.0

(13.5); tarsus, 87.6–102.6 (95.5); middle toe, 52.6–61.0 (57.7).

TYPE: Adult male, no. 261042, U.S. National Museum, Biological Surveys collection; mouth of Bear River, North Bay, Great Salt Lake, Utah; June 6, 1916; Alexander Wetmore; original no., 3227.

RANGE: S. Utah, south to c. California, c. Arizona, and Trans-Pecos Texas (at least formerly); probably south to s.w. Sinaloa and Colima. Winters from breeding range to Guerrero, Yucatán, and Guatemala.

TEXAS: *Breeding* (formerly): Altitudinal range, 3,583 to 3,612 ft. No specimen, but observation of nesting birds in El Paso Co. considered to be of this subspecies: Fabens (colony of 200 occupied nests, May 30, 1938, Mr. and Mrs. W. W. Wimberly); Tornillo (nest colony of 30, May 9, 1959, R. Fisk). *Dispersal:* Two specimens: El Paso Co., El Paso (bird previously banded at Great Salt Lake, Utah, taken Sept. 20, 1925, M. A. W. Shockley); Brewster Co., 1 mi. below Johnson Ranch (Apr. 18, 1937, J. Van Tyne).

NESTING: *Nest:* Similar to that of *L. t. candidissima*. *Eggs:* Ovate to oval; number and color similar to those of *candidissima*.

REDDISH EGRET, *Dichromanassa rufescens* (Gmelin)

SPECIES ACCOUNT

A medium-sized heron with comparatively heavy bill. *Adult (dark phase):* reddish brown head, neck; dark slaty blue (sometimes reddish-tinged) to grayish on rest of plumage; two-toned bill—terminal half or third black, flesh-colored basally; blackish or blue legs and feet. In nuptial dress, reddish plumes from crown to lower neck become long, ragged, and manelike; gray scapular plumes extend beyond tail. *Adult (white phase):* all white (may have grayish mottling on tips of primaries); unfeathered parts as in dark phase. *Immature (both phases):* bill all blackish (not two-toned); lacks plumes. Length, 29¼ in.; wingspan, 3¾ ft.; weight, 1½ lbs.

RANGE: Coastally from Texas and keys in Florida Bay, south to Bahamas, Cuba, Isle of Pines, Hispaniola, Baja California, and mainland Mexico (Sonora to Chiapas on the west; Tamaulipas and Veracruz to Yucatán Peninsula on the east), also possibly Guatemala; formerly to c. Florida and Jamaica. Exhibits mild post-nuptial wandering. In winter, some birds withdraw from Texas; essentially resident elsewhere. Occurs, but appears not to breed, on n. coast of Venezuela and adjacent offshore islands.

TEXAS: (See map.) *Resident* (largely): Breeds, early Mar. to late July—occasionally to early Aug. (eggs, Mar. 19 to July 14; young in nest as early as Mar. 28) at or near sea level. Locally common to fairly common in colonies on lower and central coasts; locally fairly common to uncommon and decreasing on upper coast north to Chambers Co. Tends to move southward for winter; after early Oct., uncommon to scarce on upper coast; fairly common to uncommon on central coast; and occasionally very common to uncommon on lower coast. *Dispersal:* Wanders unpredictably, especially postnuptially, inland to Walker, Bastrop, Bexar, and Zavala cos., where rare; casual in Tarrant, Denton,

Hunt, and Harrison cos.; accidental in Taylor Co., Camp Barkeley (Aug. 1, 1943, K. C. Parkes).

HAUNTS AND HABITS: Among the Reddish Egret's salient points are its two distinct color phases—a dark, and a less frequent light one. White birds range from 4 to 1 percent of the population in Texas. *Dichromanassa rufescens* is further impressive for its frenzied feeding operations. In addition, the species is more tied to coastal salt bays and marshes than is any other North American egret. In the United States, its breeding range is currently restricted to the Gulf coast, where it nests atop brushy *Yucca*-pricklypear (*Opuntia*) thickets on dry islands in Texas, and in red mangrove (*Rhizophora mangle*) swamps in the Florida Bay area. Texas birds are somewhat migratory. Those going southward gather two or three days prior to departure, at which time they may be seen circling over their heronry. Reddish Egrets are found, however, all along the Texas coast during cold months; seventy-three were found by Audubon Christmas bird counters during the 1970-71 season. A mild postbreeding dispersal of this egret takes place mainly on coasts between Texas and Florida, though some birds have straggled to California, Colorado, Illinois, and South Carolina.

Flight of the Reddish is light, easy, strong, and at times rather fast; it has been timed at 20 m.p.h. If walking slowly on the ground, the bird is quite graceful. When feeding, however, the Reddish Egret dashes and staggers about in shallows as if wildly excited, wings flopping and body inclining forward. It strides rapidly in one direction, abruptly halts, leaps in the air, reels usually in a half turn, descends, and lurches off on another course. Amid these frantic starts, stops, and pirouettes, it seizes prey with a swift thrusting jab

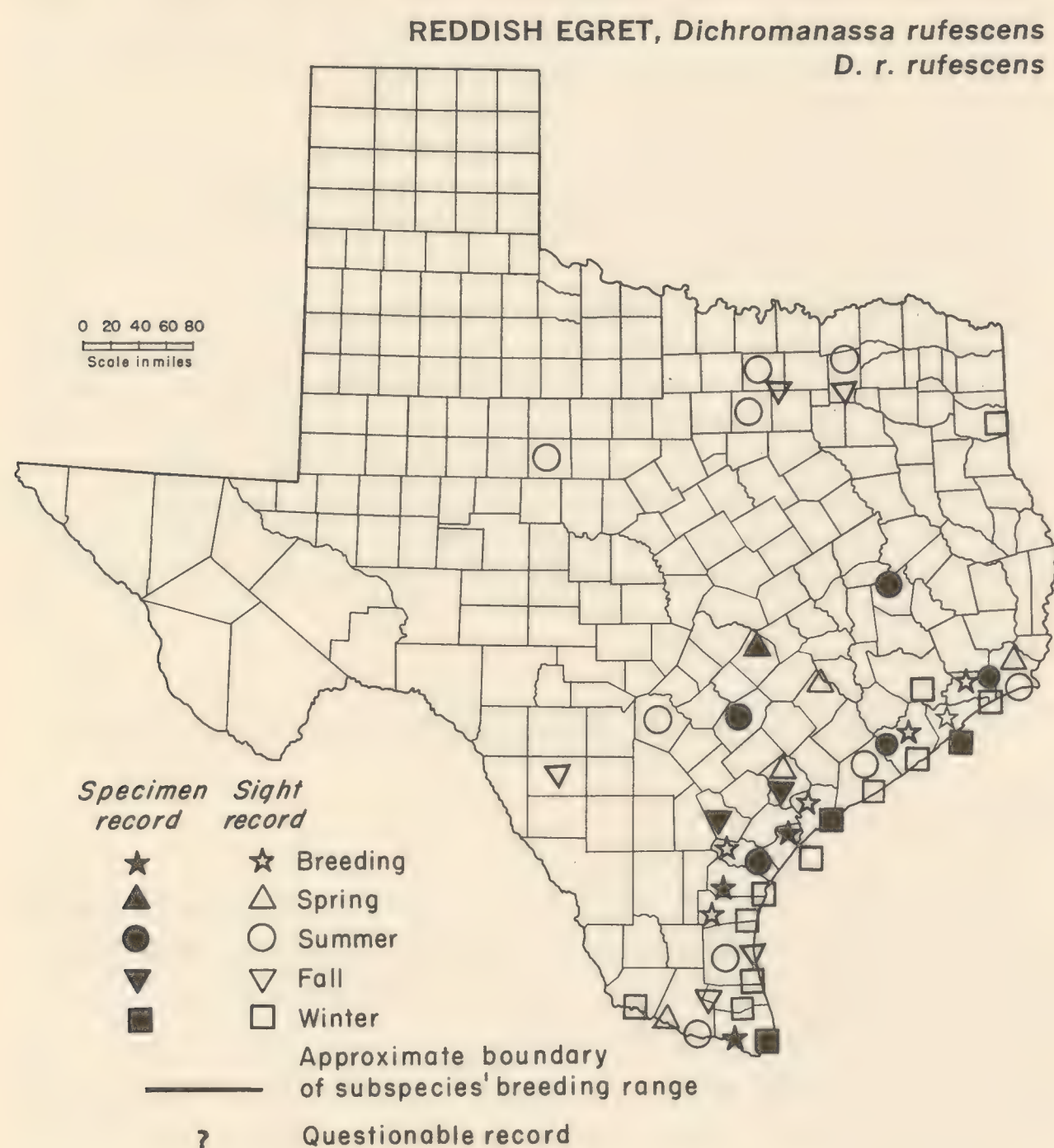
of its bill. Apparently the violent fishing actions stir up—and hence make visible—aquatic animals in the muddy salt water in which the Reddish habitually feeds. Feeding territories are vigorously defended. The bird pursues needlefish, *Cyprinodon* minnows, mullets, and other fish, also crabs, and shrimps. During occasional freshwater excursions, it catches frogs, tadpoles, and crayfish.

The Reddish Egret croaks and squawks like other herons and egrets, but rather infrequently. Birds are most vocal during the breeding season. In various stages of the elaborate pair formation, males and females exchange soft *crog-crog* calls; males in territorial threat rasp harsh *raaah's* at each other.

CHANGES: Among ardeids that are very distinct species the Reddish Egret is quite possibly the world's most restricted—both geographically and ecologically. Survival problems of this low total population are likely to become severe before the end of the twentieth century. Since most of the breeding stock appears to be in Texas, the future of *Dichromanassa rufescens* may rest with the Lone Star nesting colonies. It is of interest therefore, that a list be printed of all known Texas heronries which have contained one or more nesting pairs of this species. Following are the past and present colonies, together with a year (often the most productive) when they were known to be active:

Upper coast: Vingtune Islands, Chambers Co. (2 nests, 1 containing young; other, eggs, June 18, 1936, A. Clapp, Sr., Alexander Sprunt, Jr.); North Deer Island, Galveston Co. (200 pairs nesting, summer 1971, J. A. Lane, J. R. Smith); Bird Island, Brazoria Co. (young in nests, May 15, 1927, J. J. Carroll; breeding colony found same place, June 7, 1933, Carroll).

Central coast: Rhodes Point at Lavaca Bay, Calhoun Co. (small colony present, June 4, 1928, J. J. Carroll); Farwell Island, Calhoun Co. (young in nests banded, May 25-26, 1930, and June 11-13, 1931, J. W. Stiles); First Chain-of-Islands, Calhoun Co. (several nests found, 1936, A. Sprunt, Jr.); Shell Island in San Antonio Bay, Calhoun Co. (breeding birds met with, May 2, 1934, J. J. Carroll); Carroll Island, Calhoun-Aransas co. line (numerous nests, June 14, 1935, and June 19, 1938, A. Sprunt, Jr.); Second Chain-of-Islands, Calhoun-Aransas co. line (1,250 pairs with eggs and young, June 20, 1918, T. G. Pearson); same islands (75 pairs breeding, summer 1965, A. Sprunt IV); Ayres' Dugout, Aransas Co. (large colony with eggs, May 23, 1925, R. W. Quillin); islands in Aransas Bay near east end of St. Joseph Island, Aransas Co. (nests found, May 12-14, 1892, H. P. Attwater); Dunham Island, Aransas Co. (thousands seen in colony, May 3, 1934, J. J. Carroll); Rockport, Aransas Co. (eggs and young in nests found, May 27, 1938, F. W. Miller); St. Joseph Island, Aransas Co. (eggs collected, May 22, 1925, R. W. Quillin); Hog Island, Aransas Co. (a few nests with eggs, May 14, 1925, R. W. Quillin); Aransas Pass, junction of Aransas, San Patricio, and Nueces cos. (eggs found, May 14, 1925, May 17, 1928, and May 29, 1930, A. J. Kirn); Harbor Island, Nueces Co. (a con-



siderable number nesting, May 10, 1935, J. J. Carroll); Ransom Island, Nueces Co. (600 nests with young or eggs, May 19, 1929, A. J. Kirn); island at mouth of Nueces River, Nueces Co. (nests and eggs found, Mar. 24, 1878, G. B. Sennett); vicinity of Corpus Christi, Nueces Co. (150 nests with eggs or young, summer 1971, Kay McCracken); Nueces flats, Nueces Co. (small colony nested, May 29, 1927, J. J. Carroll); Deadman Island, Nueces Co. (eggs found, May 20, 1916, R. W. Quillin); Pelican Island in Corpus Christi Pass, Nueces Co. (a few birds building nests, Mar. 30, 1878, G. B. Sennett); 2 unnamed spoil bank islands, Nueces Co. (247 pairs, some breeding, summer 1965, A. Sprunt IV); South Bird Island in Laguna Madre, Kleberg Co. (hundreds of birds and nests, Mar. 27, 1878, G. B. Sennett); same island (26 nests found, June 17, 1935, A. Sprunt, Jr.); same island (3,000 arrived at normal time and had normal nesting, summer 1951, John Larson); same island (151 nesting pairs, summer 1965, A. Sprunt IV).

Lower coast: Green Island, Cameron Co. (5,000 birds nesting, June 3, 1920, T. G. Pearson); same island (over 2,400 adult birds at rookery, June 23–24, 1936, A. Sprunt, Jr.); same island (2,350 fledged from 675 nests, summer 1968, W. F. Fluman); Port Isabel, Cameron Co. (ca. 50 pairs with eggs and young birds, May 28, 1928, J. J. Carroll); south end of Padre Island, Cameron Co. (breeding in large numbers, late Mar., 1878, J. C. Merrill); island in Bahia Grande, Cameron Co. (thousands nesting, May, 1921, J. R. Pemberton); same place (200 young found, July 6, 1934, H. C. Blanchard); Brownsville, Cameron Co. (eggs collected, May 16, 1877, J. C. Merrill).

In 1969, the Cooperative Fish-eating Bird Survey found 234 Reddish Egrets on the upper coast, 1,220 on the central coast, and 350 on the lower coast. From the nineteenth century up until 1939, the Reddish Egret had its U.S. metropolis on the lower Texas coast with the very large heronries of Green Island and Bahia Grande raising most of the individuals. Since World War II, however, the majority of birds, at least in most years, seem to have lived on the central coast. Why this situation arose is not very apparent. However, on the central coast there are more natural and artificial spoil bank islands suitable for nesting. Also runoff from extremely poisoned cotton fields has been greater at the south tip of Texas, especially into southern Laguna Madre—chief feeding headquarters for lower coast Reddish Egrets.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN REDDISH EGRET, *Dichromanassa rufescens rufescens* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (gray phase):* Acquired by partial prenuptial molt. Head and neck all around, including long occipital and jugular plumes, dull vinaceous brown, but plumes paler; upper surface—including scapular plumes, tail, and wings—deep neutral gray, but outer edges of primaries slate gray; posterior lower parts, including lining of wing brownish neutral gray. Terminal half or third of bill black; basal portion of bill, lores, and eyelids rose color, flesh color, or pale gray-

ish ultramarine blue; iris yellow or white; legs and feet black or grayish blue, but soles of toes greenish yellow; claws black. At height of nuptial pairing, bill glossy pink, terminal half or third black; lores purplish red; iris apparently unchanged; legs bright blue; feet dull black. *Adults, nuptial (white phase):* Acquired by partial prenuptial molt. Entirely white. Bill, lores, and eyelids as in gray phase; iris white; legs and feet dark olive green; soles of toes greenish yellow. *Adults, winter (gray phase):* Acquired by complete postnuptial molt. Similar to gray phase of nuptial adults, but colors darker; scapular and jugular plumes shorter. *Adults, winter (white phase):* Acquired by complete postnuptial molt. Similar to white phase of nuptial adults, but plumes shorter. *Second winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of adults in winter, but occipital, scapular, and jugular plumes less well developed. *First nuptial (gray phase):* Acquired by partial prenuptial molt. Resembling first winter but in general lighter, with less rufescent suffusion; some new occipital and jugular plumes appearing. *First nuptial (white phase):* Acquired by partial prenuptial molt. Like second winter but having only a few plumes. *First winter (gray phase):* Acquired by wear and fading from juvenal. Head and neck vinaceous cinnamon, somewhat mixed with neutral gray; back, wings, and tail neutral gray, back and wing-coverts more or less spotted or mixed with cinnamon; lower parts, including lining of wing, pale neutral gray, more or less washed or mixed with cinnamon rufous. Bill entirely black. *First winter (white phase):* Acquired by wear from juvenal. Like first nuptial but with no occipital, scapular, or jugular plumes. *Juvenal (gray phase):* Acquired by complete postnatal molt. Resembling gray phase of first winter, but head, neck, and lower parts more brightly and richly colored. *Juvenal (white phase):* Like white phase of first winter. *Natal (gray phase):* Vinaceous wood brown, but abdomen paler; long hairlike feathers of pileum avellaneous. Naked skin of body, bill, and feet dark olive; iris pale yellow or white. *Natal (white phase):* Down all white.

MEASUREMENTS: *Adult male:* Wing, 325.1–344.9 (average, 335.0) mm.; tail, 106.4–118.1 (112.3); bill (exposed culmen), 89.9–104.9 (97.6); height of bill at base, 19.0–20.6 (19.8); tarsus, 146.0–152.9 (149.6); middle toe without claw, 66.0–73.9 (70.1). *Adult female:* Wing, 294.9–337.1 (316.0); tail, 89.9–110.0 (100.1); bill, 86.6–102.1 (94.5); height of bill, 17.0–19.6 (18.3); tarsus, 120.9–144.0 (132.6); middle toe, 62.0–70.1 (66.0).

RANGE: Locally from keys in Florida Bay, and Texas, south through n.e. Mexico to Guatemala (possibly); also Bahamas and Greater Antilles. Winters from Florida (rarely) and Texas through breeding range to Venezuela.

TEXAS: *Resident* (largely): Collected along coast northeast to Chambers, southwest to Brazoria, Calhoun, Aransas, Nueces, and Cameron cos. *Dispersal:* Collected in Walker, Bastrop, Gonzales, Victoria, and Bee cos.

NESTING: *Nest:* In colonies; in marshes, swamps, but usually on coastal islands; in low tree, bush, yucca, or cactus plant, often over or near water, or on ground; bulky platform of twigs, grasses, and other vegetation; lined with smaller twigs, rootlets, and grasses. *Eggs:* 2–7, usually 3–4; ovate to elliptical ovate or oval to elliptical oval; smooth but not glossy; greenish blue or light bluish green—from deep lichen green to pale niagara green or pale olive; unmarked; average size, 51.1 × 37.8 mm.

LOUISIANA HERON, *Hydranassa tricolor* (Müller)

SPECIES ACCOUNT

Tricolored Heron of many authors. A rather small, skinny, snaky-necked heron. *Adult:* plumage essentially two-toned—blue-gray above and white on belly—with dark purple lower neck plumes, rusty ones on back (a few long white occipital head feathers acquired in nuptial dress); thin tawny line extending down white

throat and foreneck; black-tipped blue bill; dusky yellow legs. In flight, shows white rump and wing-linings. *Immature*: reddish brown head, neck, wings; grayish brown back; white areas as in adult; bill blackish above, dull yellow below; greenish yellow legs. Length, 25½ in.; wingspan, 3 ft.; weight, 1 lb.

RANGE: On coasts from Chesapeake Bay to Florida, U.S. Gulf states, c. Baja California, mainland Mexico, Central America, and South America to Ecuador and n.e. Brazil; also Bahamas, Greater Antilles, Grand Cayman, Old Providence, St. Andrew, Aruba, Isla Margarita, and Trinidad. Disperses mildly during postnuptial season in all directions, especially noted northward. In winter largely retreats from Atlantic states.

TEXAS: (See map.) *Resident* (largely): Breeds, late Mar. to late Aug. (eggs, Apr. 5 to June 23; young in nest as late as Aug. 28) from near sea level to about 175 ft. Locally common (in rookeries) to fairly common and declining on and near coast (1,505 nests in lower Galveston Bay as late as summer 1971, J. A. Lane and J. R. Smith); has bred inland in Colorado Co. (Eagle Lake) and Austin Co.; reportedly also in Marion Co., Caddo Lake ("breeds," May-June, 1920, A. R. Cahn). Tends to move southward in winter, though remains fairly common—formerly common—to uncommon along coast most winters. *Dispersal*: Migrates and wanders irregularly, especially postnuptially, inland to Webb, Bexar, Travis, and Lee cos., where uncommon to scarce; scarce farther north to Taylor, Young, Denton, Lamar, and Bowie cos.; rare in Trans-Pecos.

HAUNTS AND HABITS: Expansive coastal marshes of the southeastern United States are more or less the year-round home for the Louisiana Heron; it is found near salt water particularly during the nesting season.

Among U.S. herons, only the Reddish Egret is more closely tied to coastal haunts. Habitat for the present species varies from jungly mangrove-tropical buttonwood (*Conocarpus*) islands of southern Florida to sparsely vegetated oyster reef isles on the Gulf coast of Texas. Colonies of this very gregarious species are usually shared with other herons, egrets, and water birds; however, on the edge of its range it is likely to form smaller rookeries of its own kind. Postbreeding dispersal, although not as dramatic as that of the Little Blue Heron, takes the Louisiana Heron to inland fresh waters chiefly in southern California, up the Rio Grande, and in northern Texas, Oklahoma, Arkansas, and northern Louisiana; extreme vagrants have reached Oregon, Nebraska, Pennsylvania, and Maine.

Flight is strong and direct as the bird moves along with regular, rather deep-stroked flaps of the wings. The slender (even for a heron) Louisiana, whose genus name *Hydranassa* translates "queen of the water," is an active and graceful fisher. It does not appear so frantic in its action as the Reddish Egret. Rarely does the Louisiana forage on land. In water—salt, brackish, or fresh—it wades often up to its belly, and it can run quite fast in shallows. At weedy margins of ponds, it still-hunts, but prey is also sought in swift dashes. Wings partially raised, the bird changes direction rapidly and frequently with balletic precision, perhaps these movements serving to confuse its victim. Often doubled at the knees, it leaps to seize a fish or other aquatic animal in its dagger beak. Plots on feeding waters are vigorously defended. Here birds hunt for killifish, other minnows, prawns (and to a lesser extent crayfish), small frogs, weevils, grasshoppers, waterbugs, water beetles, dragonflies, and spiders.

These noisy birds utter many croaks and squawks, usually in the rookery area. During the breeding season, territorial disputes between males are often accompanied with nasal *aaah*'s or *aarh*'s. Rasping *raah*'s, sounded most often by quarreling individuals, are heard on feeding ponds.

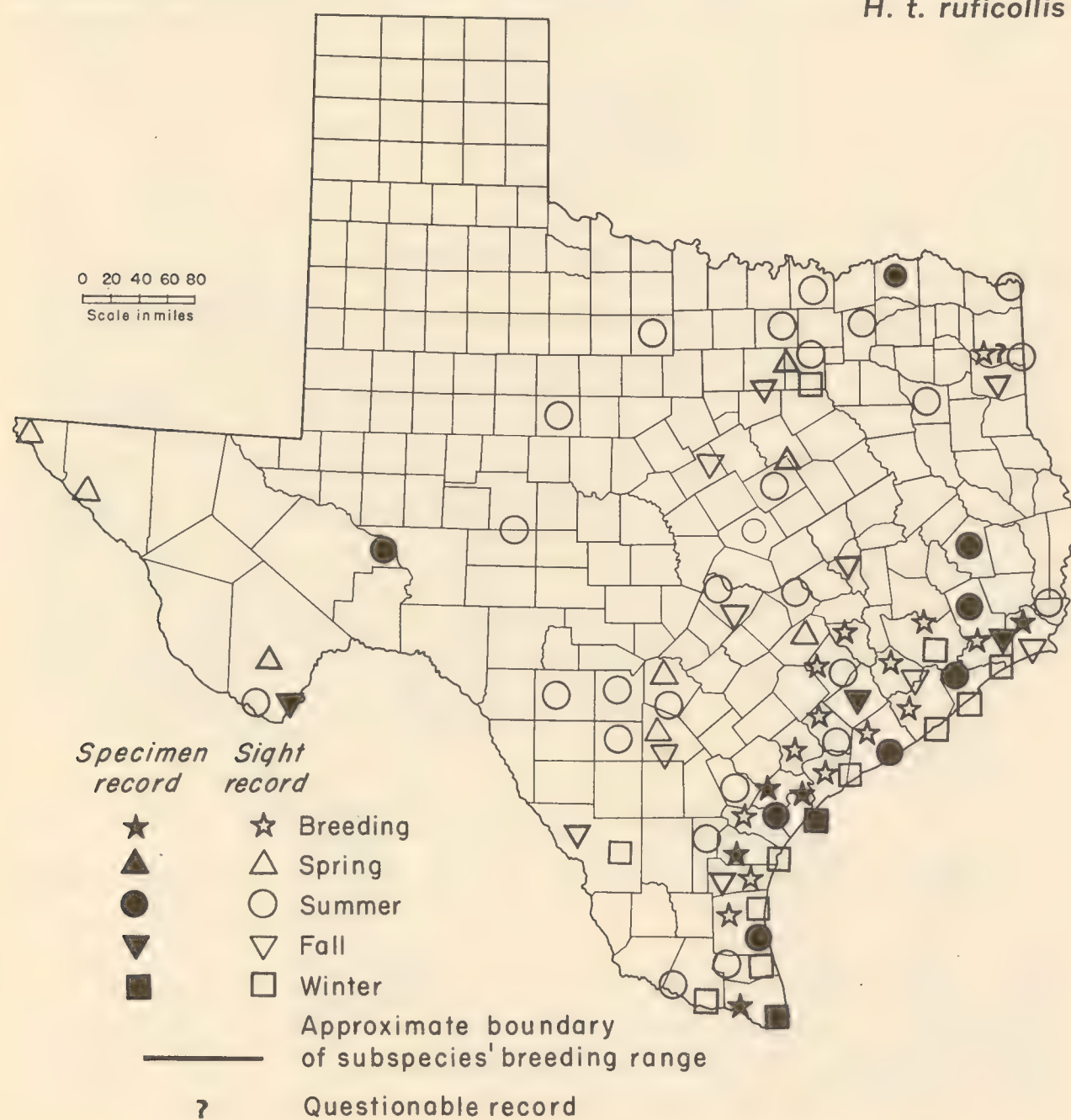
CHANGES: Old-time Texans know that Louisiana Herons and their habitat have been decreasing since at least 1939, but figures to prove this are hard to come by. As birds become scarcer, survivors are more avidly searched for by increasing hordes of bird watchers. The 1969 Cooperative Fish-eating Bird Survey is a good example of a count that should have been made—but wasn't—every year since the invention of the airplane. This 1969 census showed 2,493 Louisiana Herons on the upper coast, 1,780 on the central coast, and 800 on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN LOUISIANA HERON, *Hydranassa tricolor ruficollis* (Gosse)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Top and sides of head and of neck dark or dusky neutral gray; long plumes of hindneck and sides of lower neck dark slate purple; a few pointed white plumes spring from back of head; back and wings deep neutral gray, primaries

LOUISIANA HERON, *Hydranassa tricolor*
H. t. ruficollis



dull slate color, lesser coverts dark neutral gray; lower back, rump, upper tail-coverts, and basal portion of scapulars white; long decomposed scapular plumes wood brown; chin white; central line of throat tawny to chestnut, bordered on each side by dull slate color; posterior lower parts, including jugulum and lining of wing, pure white. Terminal part of bill clove brown, slate black or black, remainder azure blue; bare lores campanula blue; iris geranium red; legs pinkish drab or slate color; toes olive drab; soles of toes straw yellow. At height of nuptial pairing, lores lavender; legs and feet orange. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but long white occipital plumes absent, scapular and jugular plumes much shorter. *First nuptial*: Acquired by partial prenuptial molt. Similar to adults in winter, but with much more chestnut on neck and wings. *First winter*: Acquired by wear from juvenal, which is worn during winter with little or no change. *Juvenal*: Acquired by complete postnatal molt. Pileum, back, wings, and tail deep neutral gray; lesser wing-coverts, hindneck, and foreneck chestnut or bay; mantle washed with same color; lower back, rump, upper tail-coverts, chin, cheeks, upper throat, posterior lower parts, and much of middle line of foreneck white, breast streaked with neutral gray and chestnut. Bill mostly yellow, but culmen and terminal third of maxilla dull black; iris yellowish white; legs and feet greenish olive. *Natal*: Head fawn color or vinaceous, ends of long hairlike feathers paler; back fuscous or hair brown; under parts white or buffy white. Bill, feet, and naked skin light green, the bill and feet partly yellow.

MEASUREMENTS: *Adult male*: Wing, 235.0–267.0 (average, 252.5) mm.; tail, 79.0–89.9 (85.9); bill (exposed culmen), 88.9–101.9 (97.3); height of bill at base, 15.0–16.0 (15.2); tarsus, 91.9–104.9 (100.8); middle toe without claw, 62.0–71.1 (66.8). *Adult female*: Wing, 230.1–246.1 (238.0); tail, 78.5–86.6 (82.3); bill, 87.1–98.1 (92.7); height of bill, 14.0–15.0 (14.7); tarsus, 84.6–94.0 (90.7); middle toe, 58.4–62.5 (60.5).

RANGE: Locally on coasts, from Maryland to Florida and Texas, and from c. Baja California along both slopes of Mexico and Central America to n.w. Ecuador, Colombia, and Venezuela; also Bahamas, Greater Antilles, Grand Cayman, Old Providence, St. Andrew, Aruba, and Isla Margarita. Withdraws in winter from Maryland, Virginia, and North Carolina.

TEXAS: *Resident* (largely): Collected chiefly along coast northeast to Jefferson (eggs), southwest to Matagorda, Refugio, Kenedy, and Cameron cos. *Dispersal*: Collected in Lamar, Dallas (exact date unknown), Polk, Bexar (exact date unknown), Pecos, and Brewster cos.

NESTING: *Nest*: Often in large colonies; in swamps, marshes, or on coastal islands; in bush or tree; poorly constructed, rather bulky platform of sticks, pieces of cane, and similar materials; commonly lined, if at all, with smaller pieces of same materials. *Eggs*: 2–7, usually 4–5; oval to elliptical oval to ovate or elliptical ovate; pale greenish blue or bluish green to pale niagara green or lichen green; unmarked; average size, 43.9 × 32.3 mm.

LITTLE BLUE HERON, *Florida caerulea* (Linnaeus)

SPECIES ACCOUNT

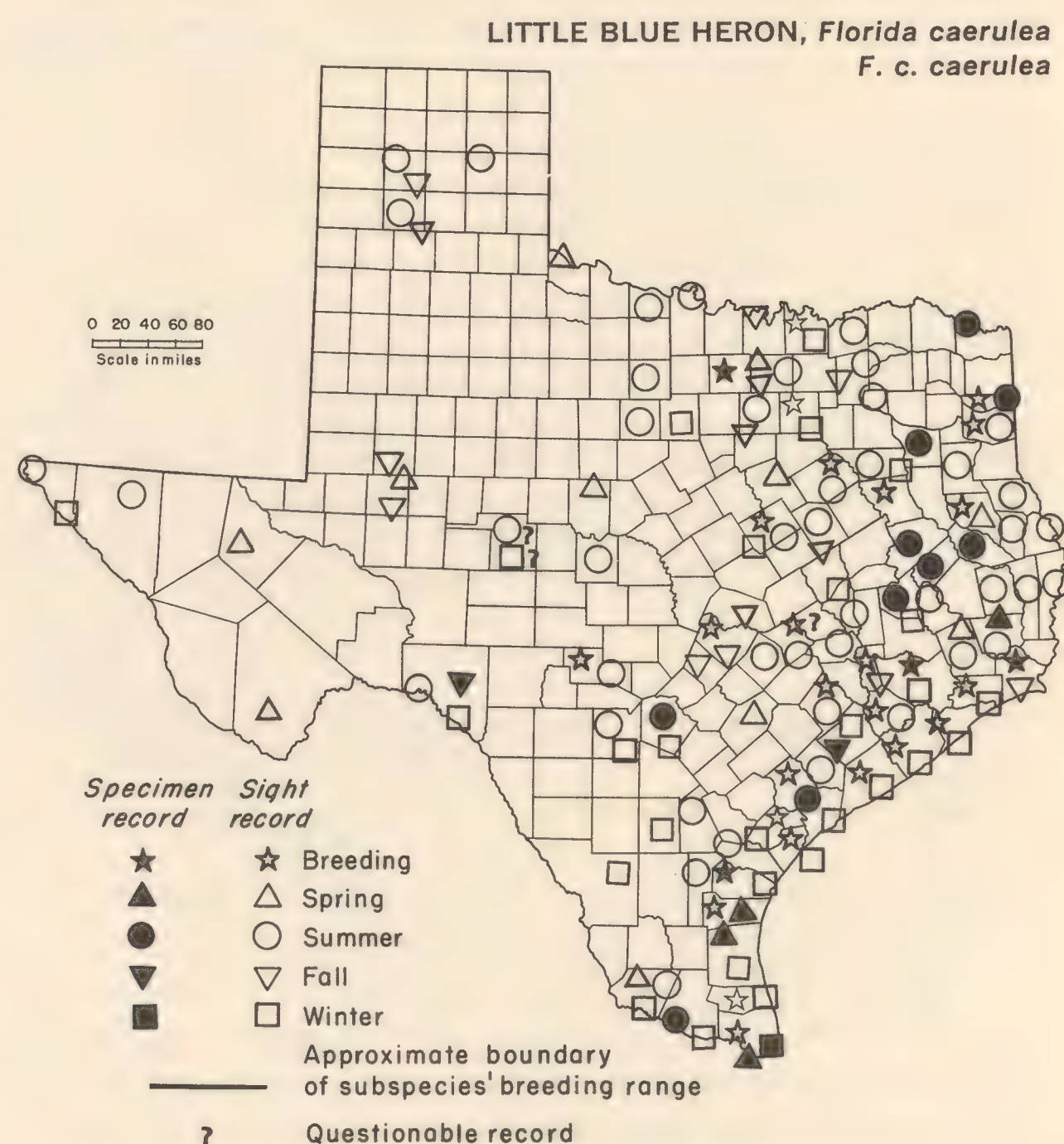
A rather small heron. *Adult*: maroon head and neck; dark bluish gray on remainder of plumage; two-toned bill (black-tipped, bluish gray on basal two-thirds); blackish green legs. *Immature*: at first white, but becoming splotched randomly with grayish; has greenish legs and feet; when all white, best told from the similar young Snowy Egret by its stouter, blackish bill, basally grayish or greenish (not uniformly black). Length, 23¼ in.; wingspan, 3¼ ft.; weight, 13½ oz.

RANGE: Locally from c. Oklahoma, Texas, w. Tennessee, Georgia, and Atlantic coast from Maine (first breeding, 1971), south through Mexico (chiefly coast-

ally) and Central America to Ecuador, Brazil, and Uruguay (range in South America inadequately known); also Bahamas, West Indies, Trinidad, and Tobago. Indulges in extensive postnuptial wanderings; U.S. individuals disperse northward as far as s. Ontario and s. Quebec. Northern race winters chiefly from South Carolina, Florida, and Gulf coast to Colombia and Venezuela; also Bahamas, Cuba, Jamaica, and Guadeloupe Island.

TEXAS: (See map.) *Breeding*: Mar. to Aug. (eggs, Apr. 16 to June 16; young in nest, May 12 to July 29) from near sea level to at least 1,500 ft. Locally very common (in rookeries) to uncommon and probably declining on and near coast; irregularly common to scarce in rookeries scattered over remainder of eastern half west to about 98th meridian—once to near 100th meridian. Populations apparently holding up reasonably well (e.g., Rosenberg heronry in Fort Bend Co. doubled to 250 birds from 1969 to 1971; and Warren L. Ranch rookery in western Harris Co. jumped from 1 to 300 between 1970 and 1971, fide D. H. Hardy). *Winter*: Mid-Nov. to mid-Mar. Fairly common to uncommon on and near coast; rare elsewhere in eastern half; casual in western portions of south Texas to Del Rio; accidental at El Paso (Dec. 24, 27, 1938, T. M. Kirksey). *Dispersal*: Migrates and wanders irregularly, especially postnuptially, to all major portions of Texas; however, is rare in semiarid northwestern third.

HAUNTS AND HABITS: The Little Blue Heron is remarkable for having its white phase, present in various species of herons, restricted to its young. The shadow-dark adult Little Blue breeds in the United States chiefly in and along freshwater marshes, streams, creeks, and bayous that meander through hardwood forests in the southeastern states. If sharing a rookery



with other herons, *Florida caerulea* usually nests on the periphery. Following the nesting season there is an intensive dispersal with birds commonly going as far north as the U.S.-Canada border; as is usual with wildlife, the young normally travel farthest. Most birds leave the United States during cold months. Those that linger through winter drop to the Gulf coast but, even at this season, rarely occur in salt water. During the nonbreeding season, Little Blues are seen singly or in small gatherings up to fifteen or twenty individuals. Often, slaty old birds, white youngsters, and blotched intermediates—called “calico cranes”—are seen in the same group, which may also contain one or two Louisiana Herons.

Flight of this slender heron is light but strong. When alighting, it scales down on set wings or abruptly descends almost vertically. With measured steps, it walks slowly and deliberately along shallow margins of feeding ponds in its search for food. Prey is seized in its bill with a seldom-misfired thrust of the neck and head. It forages by day, usually in early morning and late afternoon, and at dusk flies to night roosts in trees. Little Blues, as a rule, eat more crustaceans (largely crayfish) than fish, although the latter is an important item; other foods are small snakes, frogs, and turtles, grasshoppers, dragonflies and nymphs, water beetles and their larvae, and spiders. This species' fondness for “crawfish” earned it—and, to a lesser extent, its relatives—the name “levee walker” in the old-time Texas and Louisiana rice fields.

The Little Blue Heron is rather quiet; however, males confronting in territorial display during the breeding season emit harsh reedy *arrh*'s. A strident croak is sounded when an individual is disturbed; a more startled bird utters a rough *gerr gerr gerr gerger*.

CHANGES: Probably the most astonishing thing about the Little Blue Heron is its resistance to extermination. As late as 1969, the Cooperative Fish-eating Bird Survey found 2,228 Little Blues on the upper coast, 115 on the central coast, and 70 on the lower coast. The count is amazing, considering that the census was made in late May and early June when most *Florida caerulea* are attempting to breed inland at freshwater localities. Since 1959, Little Blue has had to eat poisoned crayfish and other aquatic animals in highly toxic places, such as rice fields drenched with chlorinated hydrocarbons and mercury. Beginning at the same time, ever-increasing hordes of Cattle Egrets have invaded scarce nesting sites and stolen nest sticks. The extremely aggressive Cattle Egret, feeding as it does in unsprayed cow pastures, must carry a much lower burden of pesticides than does the Little Blue.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN LITTLE BLUE HERON, *Florida caerulea caerulea* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head and neck dark slate purple or anthracene purple; throat, back, wings, tail, and long dorsal plumes slate color; posterior lower parts, jugular plumes, and lining of wing

lighter. Bill azure blue at base, terminal half or third black; lores and eyelids campanula or ultramarine blue; iris smoke gray, pale yellow, or dark plumbeous; bare portion of legs and toes black or blackish slate. At peak of nuptial pairing, bill glossy deep blue, terminal third black; lores bright medium blue; legs and feet black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but with only a few short dorsal plumes; head and neck more purplish (less reddish); chin and throat often with some dull white. Bill plumbeous, terminal third black; iris sulphur yellow or gray; lores and eyelids pale dull green; legs and feet uniform pea green, darker on joints. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but upper parts duller, more brownish or blackish (less clearly bluish slate); posterior lower parts duller, more brownish. *Second winter*: Acquired by complete postnuptial molt. Similar to second nuptial, but with only a few short dorsal plumes; head and neck more purplish (less reddish), and with often some dull white on chin and throat. *First nuptial*: Acquired by partial prenuptial molt. Crown pale slate gray; wings and tail mostly slate color or mostly white; feathers of back partly slate gray; rest of plumage dull white or grayish white, variously mixed with slate-colored feathers; occipital, dorsal, scapular, and jugular plumes more or less developed. *First winter*: Attained by wear from juvenal, from which it does not differ materially. Bill often blackish, greenish basally. *Juvenal*: Attained by complete postnatal molt. Nearly all pure white; ends of primary feathers, sometimes middle of back and crown, pale neutral gray or brownish neutral gray; entirely without plumes. Bill pale lilaceous or bluish white on terminal portion; iris naples yellow or yellowish white; legs and feet pea green or olive green, sometimes tinged with blue. *Natal*: Pale brownish gray. Bill orangish; iris yellowish; legs pale grayish green.

MEASUREMENTS: *Adult male*: Wing, 251.0–267.0 (average, 259.8) mm.; tail, 93.0–102.6 (97.3); bill (exposed culmen), 71.9–79.0 (75.7); height of bill at base, 14.5–17.5 (15.7); tarsus, 86.6–104.6 (96.3); middle toe without claw, 61.0–65.0 (62.7). *Adult female*: Wing, 241.0–263.9 (250.2); tail, 83.1–101.6 (91.7); bill, 65.0–80.0 (73.7); height of bill, 13.0–16.0 (14.5); tarsus, 82.6–103.6 (91.2); middle toe, 55.6–64.0 (60.2).

RANGE: Identical with that of species with exception of Bahamas, West Indies, and South America.

TEXAS: *Breeding*: Collected north to Wise (eggs), east to Bowie, Marion, Angelina, and Jefferson (eggs), southwest to Nueces (eggs) and Cameron cos. *Winter*: Taken in Cameron Co. *Dispersal*: One specimen: Val Verde Co., Devils River, 2½ mi. above confluence with Rio Grande (Sept. 20, 1890, W. Lloyd).

NESTING: *Nest*: In colonies; in swamps, marshes, occasionally on coastal islands; in tree or bush, usually over water; loose platform of twigs; usually with lining of fine twigs, or none. *Eggs*: 2–9, usually 4–5; oval, ovate, or sometimes elliptical ovate or elliptical oval; light bluish green—from light niagara green to lichen green; unmarked; average size, 43.9 × 33.5 mm.

GREEN HERON, *Butorides virescens* (Linnaeus)

SPECIES ACCOUNT

A very small, dark heron with short, greenish yellow or orange legs. *Adult*: glossy blackish crest, quite ragged when raised; maroon or chestnut sides of head, neck, chest; white on chin extending as narrow broken line down neck; glossy grayish green back, appearing bluish in some lights; blackish green wings, tail; brownish gray below. *Immature*: greenish black cap; chestnut-, buff-, and blackish-streaked sides of head, neck; dark olive back, wings; whitish below, streaked with dark brown. Length, 18½ in.; wingspan, 27½; weight, 6½ oz.

RANGE: S.W. British Columbia (successful nesting, 1971) and s. Washington, and South Dakota to New Brunswick, south through Mexico and Central America to Panama; also Bahamas, West Indies, Tobago, possibly Trinidad. Winters chiefly from s. California, s. Texas, and Florida to n. Colombia and n. Venezuela.

TEXAS: (See map.) *Breeding*: Early Mar. to mid-July (eggs, Mar. 29 to June 28; young in nest, May 5 to July 6) from near sea level to about 2,400 ft.—at least formerly to 3,700 ft. Locally fairly common to uncommon over eastern half, west to about 100th meridian; formerly uncommon to rare and highly irregular farther west in El Paso region (last record, Ysleta, breeding, May 31, 1938, T. M. Kirksey), Winkler (eggs taken, June 16, 1916, E. F. Pope), Ector (eggs taken, May 21, 1913, Pope), and Brewster (Castolon, eggs taken, May 7, 1935, G. M. Sutton) cos. *Migration*: Mid-Mar. to mid-May; mid-Aug. to mid-Nov.—occasionally into late Nov. Locally common to uncommon over eastern half, west to about 100th meridian; irregularly fairly common to rare over western half. *Winter*: Late Nov. to late Feb. Uncommon to scarce in Rio Grande delta and along coast from Brownsville north to Chambers Co.; scarce to rare from Rio Grande delta upriver to El Paso; very rare elsewhere north to about 31st parallel; accidental at San Angelo (Dec. 23, 1970, fide T. C. Maxwell) and Fort Worth (Dec. 23, 1927, F. B. Isely).

HAUNTS AND HABITS: The Green Heron, a bit larger than the Least Bittern, is the next smallest of the North American Ardeidae. Although somewhat less reclusive than its cousin, *Butorides virescens* is rather bitternlike in appearance, especially when young. This widely distributed heron occurs in all manner of streams, ponds, swamps, marshes, and like situations—preferably fresh but also salt—in pine or mixed woods, brushy thickets,

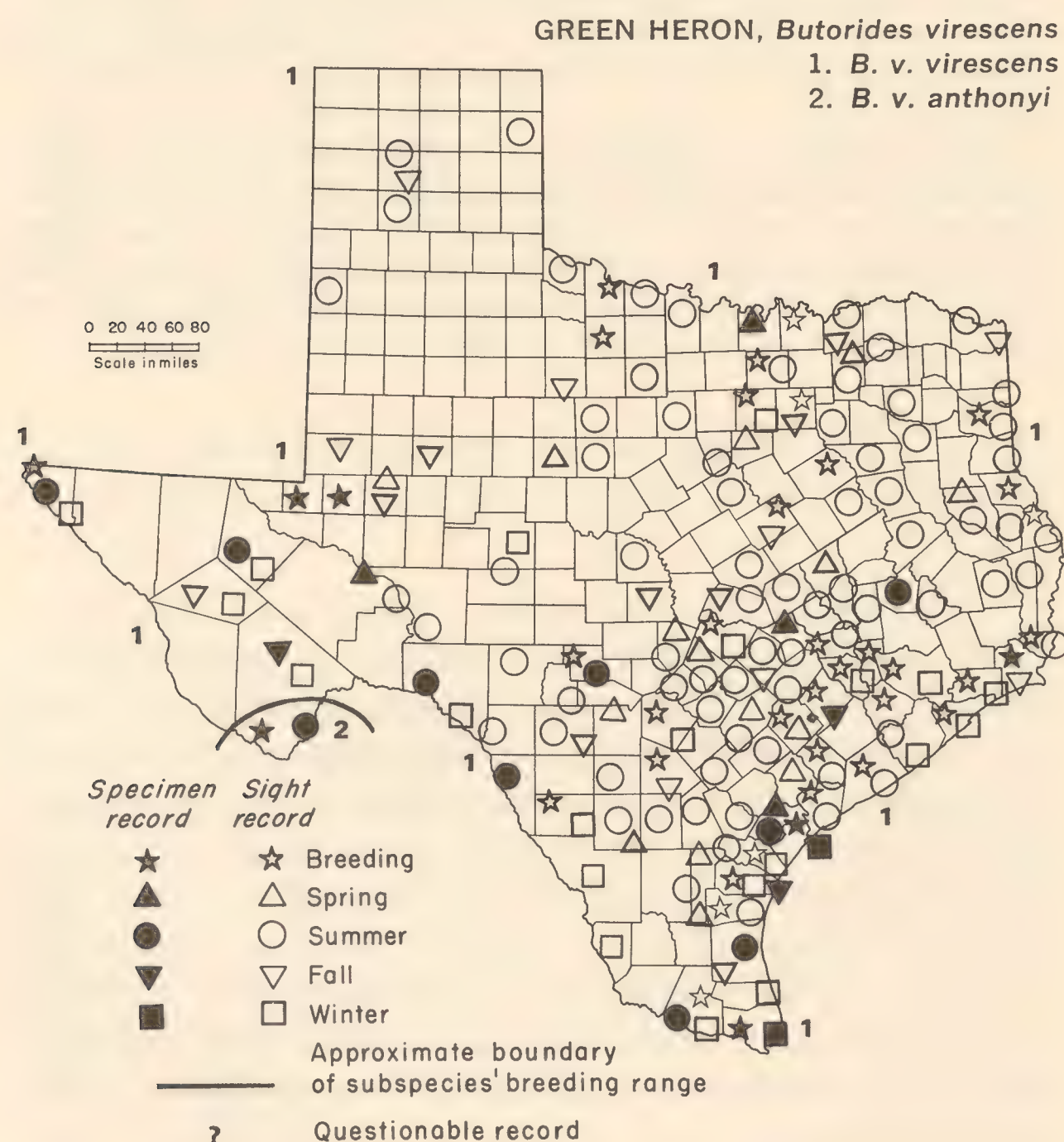
mangroves, reeds, and cattails. In the more arid parts of inland Texas, this and the Great Blue Heron are the members of their family most likely to be seen. Most portions of the Green Heron's U.S. range are vacated in winter. Though much transit is nocturnal and singly or in small groups, a dozen or more may gather during the day at optimum feeding places (man-made impoundments, such as sewage evaporation ponds, are particularly attractive); thus, its migratory movements are rather conspicuous. Postbreeding dispersals of the Green are considerably less extensive than those of some of the larger herons.

When suddenly disturbed, a Green Heron flies off rather quickly, crest perked and legs dangling, and often with a loud *skow!* An agitated bird, if perched, usually flicks its short tail quite forcefully. Sustained flight is strong and direct; individuals have been clocked at from 18 to 34 m.p.h. When moving to roost it usually alights on the exact spot where it intends to stay, rather than roving amid foliage to a final perch. Nestling Green Herons climb nimbly about the nest tree, aided by wings and bill; young birds are also eager and agile swimmers. The Green Heron pursues a variety of feeding operations. Chiefly, it still-hunts from shoreline, where the only action is a quick stabbing thrust of the neck and head to seize prey in its bill. At such times, a bird usually crouches nearly horizontal to the ground, on almost the full length of its tarsi, until it suggests a dead branch lying on the bank. Sometimes it very slowly stalks its prey, walking, as Alexander Sprunt describes, as if on eggs. This heron, more than its relatives, also hunts by jumping or diving into water to capture its victim. Fish—killifish, other minnows, sunfish, catfish, carp, gobies, bass, goldfish, silversides, eels, others—comprise the larger portion of its diet; Green Herons also eat many grasshoppers and crayfish, dragonflies and larvae, damselflies, water bugs, crickets, katydids, spiders, earthworms, frogs, small snakes, and snails.

The squawking explosive *skow!* or *skeow!* of the Green Heron is most frequently heard from flushing individuals or passing migrants, especially in fall. *Ku-ku-ku-ku-ku*'s are stuttered by birds when disturbed at the nest.

CHANGES: Within Texas, the Green Heron is generally becoming more localized as a nester, and apparently one subspecies no longer breeds in the state. J. Van Tyne and G. M. Sutton discovered a nest of *B. v. anthonyi* at Castolon in Brewster County on May 7, 1935. This was the last hard evidence of breeding of this form in Texas. R. H. Wauer, chief naturalist at Big Bend National Park from 1966 to 1972, states, however, that Green Herons (race undetermined) are still present from April 1 to November 19 and that nesting remains possible.

The Cooperative Fish-eating Bird Survey of 1969 found 100 Green Herons on the upper Texas coast, 8 on the central coast, and 10 on the lower coast. These figures give almost no indication of the overall Texas *Butorides virescens* population since the species is a



water bird which, unlike most others, is not especially attracted to the coast.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN GREEN HERON, *Butorides virescens virescens* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Head metallic bottle green; malar stripe cream buff; submalar stripe, cheeks, sides and back of neck purplish maroon; upper surface of body metallic bottle green; narrow plumes on back somewhat bluish; wings fuscous; primaries and outer secondaries dark greenish blue slate color with inner primaries narrowly tipped with white; tertials and wing-coverts metallic bottle green; outer scapulars and lesser and median wing-coverts margined with tawny ochraceous or buff; greater coverts and outer webs of tertials and of innermost secondaries edged with white; tail dull blue-green; chin and middle of upper throat creamy white, streaked with dark brown; jugulum maroon, streaked with creamy white and dark brown; remainder of lower parts mouse gray to deep mouse gray, thighs rufescent; lining of wing slate gray margined with buff; edge of wing buff or buffy white. Bill black, but mandible usually in part straw yellow or dull green; lores olive green to bright yellow; eye-ring yellow; iris orange-yellow or gamboge yellow; legs and feet olive green, yellowish green, or olive yellow; claws brown. At height of nuptial pairing, bill glossy black; lores bluish black; iris deep orange; legs and feet glossy orange. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male but smaller; upper parts duller; plumes of back shorter. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, first nuptial:* Attained by partial prenuptial molt from first winter. Resembling adult male, but upper parts duller, plumes shorter and less well developed; edges of superior wing-coverts broader, inner primaries, outer secondaries, primary coverts, and greater wing-coverts each with white or buffy spot at end of shaft and principally on outer web; wing-quills duller, more brownish, less greenish, greater coverts broadly rounded instead of obtusely pointed as in adult; white on jugulum and breast more extensive. *Male, first winter:* Acquired by wear from male juvenal, with which it is identical. *Female, first nuptial:* Attained by partial prenuptial molt. Similar to first nuptial male, but upper parts duller, plumes shorter and less well developed. *Female, first winter:* Acquired by wear from juvenal, with which it is identical. *Male, juvenal:* Attained by complete postnatal molt. Upper parts duller and more brownish than first nuptial male and lacking glaucous sheen and dorsal plumes; feathers more edged with rufous or ochraceous; primaries, outer secondaries, primary coverts, and greater wing-coverts tipped with white or buff; other wing-coverts much more broadly margined with dull white or ochraceous; some coverts with terminal shaft spots of buff; sides of head and of neck much paler and duller and streaked with dark brown or blackish; lower parts dull white, heavily streaked with hair brown, dark brown, or mouse gray. Bill mostly dull green with only culmen brownish, mandible largely light yellow; legs and feet dull greenish yellow or olivaceous. *Female, juvenal:* Attained by complete postnatal molt. Similar to juvenal male but smaller; upper parts duller, more brownish; sides of head and neck usually paler and more streaked with buff or ochraceous; top of head with more streaks of chestnut or buff. *Natal:* Down very sparse, longest on top of head, thickest on back; smoky gray above; light gray below.

MEASUREMENTS: *Adult male:* Wing, 176.0–188.0 (average, 181.3) mm.; tail, 61.5–71.1 (66.5); bill (exposed culmen), 57.9–69.1 (60.7); height of bill at base, 10.9–13.0 (12.2); tarsus, 51.1–56.9 (53.1); middle toe without claw, 44.2–48.5 (46.3). *Adult female:* Wing, 169.9–183.6 (175.3); tail, 58.4–74.4 (65.5); bill, 55.9–62.5 (59.7); height of bill, 8.9–12.7 (11.7); tarsus, 48.0–55.1 (51.3); middle toe, 43.9–49.0 (45.7).

RANGE: S.e. South Dakota to New Brunswick, south to s.

Texas and Florida, thence through Tamaulipas, Veracruz, and Yucatán Peninsula, Sinaloa, Michoacán, Guerrero, and Chiapas, possibly to Guatemala and n. Honduras. Winters from s. Texas (rarely) and Florida to n. Colombia; also Greater Antilles.

TEXAS: *Breeding:* Altitudinal range, near sea level to about 2,400 ft.—at least formerly to 3,700 ft. Collected north to Cooke, east to Jefferson, south to Cameron, west to Kerr cos.; formerly farther west to El Paso Co. *Migration:* No specimen taken outside present and former breeding range; status and distribution like that of species (see species account). *Winter:* Two specimens: Aransas Co., Aransas Bay (Jan. 4, year unknown, F. B. Armstrong); Cameron Co., Brownsville (Feb. 9, 1897, F. B. Armstrong).

NESTING: *Nest:* In woods, marshes, or thickets, usually near water; sometimes in colonies; in tree, bush, or muskrat house, or occasionally on ground; poorly built platform of sticks, weeds, cattails and other reeds. *Eggs:* 3–9, usually 4–5; ovate or oval; smooth; pale green or pale greenish blue, pale glaucous green or pale olivine; unmarked; average size, 38.1 × 29.4 mm.

ANTHONY'S GREEN HERON, *Butorides virescens anthonyi* (Mearns)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *B. v. virescens* but much larger; foreneck more cinnamonaceous or fulvescent; posterior lower parts much paler; upper surface of body and hindneck lighter, green of body duller, and chestnut of hindneck more fulvescent.

MEASUREMENTS: *Adult male:* Wing, 186.2–201.9 (average, 196.1) mm.; tail, 67.1–79.0 (72.7); bill (exposed culmen), 57.7–64.0 (61.0); height of bill at base, 10.9–13.5 (12.2); tarsus, 51.1–56.4 (53.8); middle toe without claw, 43.4–49.0 (47.8). *Adult female:* Wing, 180.1–196.1 (189.7); tail, 63.0–74.4 (69.8); bill, 56.4–62.0 (60.2); height of bill, 10.4–13.0 (11.7); tarsus, 48.0–54.6 (52.6); middle toe, 42.9–48.0 (45.5).

RANGE: S.w. British Columbia and s. Washington, south to n. Baja California, n. Sonora, and c. Arizona; formerly to extreme s. Trans-Pecos Texas (Big Bend). Winters from s. California and s. Arizona to s. Baja California, locally through w. mainland Mexico to Costa Rica.

TEXAS: *Breeding* (formerly): Three specimens, all from Brewster Co.: 15 mi. south of Marathon (June 1, 1933, G. M. Sutton); vicinity of Castolon (May 9, 11, 1935, Sutton).

NESTING: *Nest:* Along streams or irrigation ditches, about ponds, even in orchards, occasionally some distance from water, and not infrequently in colonies; 10–50 ft. above ground, in willow or cottonwood tree, or in a bush; loosely constructed, bulky, rough platform of sticks and small twigs, with shallow depression at top; lined with fine twigs, often with leaves attached. *Eggs:* 3–9, usually 5; ovate or oval to elliptical oval; light greenish blue or light bluish green; unmarked; average size, 39.1 × 29.7 mm.

CATTLE EGRET, *Bubulcus ibis* (Linnaeus)

SPECIES ACCOUNT

Also known as Cattle Heron and Buff-backed Heron. Often placed in genus *Ardeola*. A small white egret—puffy-chinned, short-necked, and stocky—with comparatively thick, yellow bill; short, brownish yellow (blackish in immature) legs. Nuptial bird acquires orangish buff patch on breast and elongated orangish buff plumes from forehead to nape and on mantle; bill becomes dull red basally, legs dusky magenta. Length, 18–22 in.; wingspan, 3 ft.; weight, 10–14 oz.

RANGE: From original range in subtropical and tropical Europe, Africa, and Asia has recently expanded incredibly and now inhabits every major land region

except Arctic, Greenland, and Antarctica. Wanders widely during postbreeding season. In winter withdraws from colder portions of range.

TEXAS: (See map.) First confirmed Texas sighting: Nueces Co., Mustang Island (one immature bird, Nov. 25, 26, and 27, 1955, Connie Hagar and members of Texas Ornithological Society field trip). First indication of breeding: Galveston (many young seen, Aug. 17, 1958, Norma C. Oates). An amazing population explosion has lifted this species to the following status with probability of continuing increase. *Resident* (largely): Breeds, Apr. to Sept. (eggs, Apr. 20 to Aug.; young, June 30 to Aug. 17) from near sea level to about 500 ft. Locally abundant to fairly common in rookeries on upper coast and in eastern portion west to about 97th meridian; irregularly very common to uncommon on central and lower coasts. *Dispersal:* Migrates and wanders irregularly, especially postnuptially, over lowlands of east and south Texas north to Grayson, Denton, Llano, Bexar, Uvalde, Zavala, and Maverick cos. Tends to move southwestward along coast and inland up riverbottoms in fall and winter (abundant some winters on lower coast; irregularly common to uncommon on central and upper coasts). Wanders irregularly into western half, where rare but increasing, especially in flatland ranch and farm areas.

HAUNTS AND HABITS: The Cattle Egret continues to astound ornithologists. Within the historic period it is the only bird species which has conquered every continent (except Antarctica) without benefit of transport by man. Further, it is apparently the only nonpasserine (primitive) bird that during the twentieth century is greatly flourishing and expanding its range. All other species are either nearly static or declining.

Prime habitat for the Cattle Egret is a warm grassy plain or savannah well stocked with large grazing

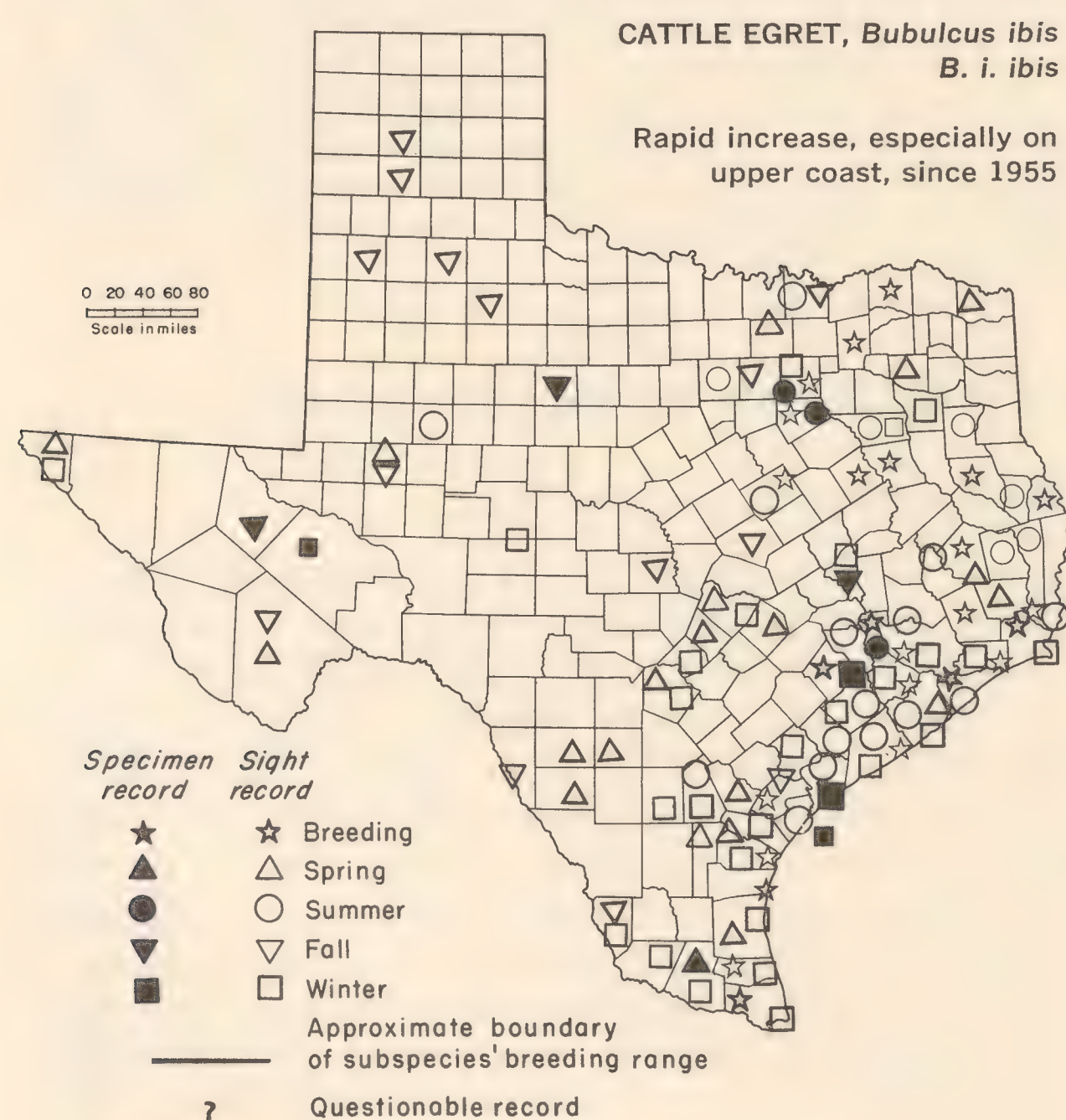
mammals, such as abound in east Africa and on Texas cattle ranches. Unlike other members of its family, *Bubulcus ibis* has little use for water in its daily feeding activities, but it does build its nest in vegetation growing in or beside a pond or lake.

Flight of the Cattle Egret is noticeably different from that of other herons due to its quicker wing-beats stroked in a small arc. When standing on the ground, it holds its neck either straight or retracted; in the latter posture a bird appears hunchbacked and almost neckless. Less reclusive than other ardeids, especially the night herons and bitterns, it tends to ignore disturbances by people and their vehicles. Throughout the day it moves about in pastures, fields, and similar open areas, usually beside the mouth or feet, or upon the back, of its associate cow, water buffalo, horse, pig, rhinoceros, eland, elephant, or other hoofed animal; in Puerto Rico and elsewhere, some birds even develop bonds with moving tractors. Around an ally, one or several birds form necessarily amorphous feeding territories which they defend from other Cattle Egrets. Should their "territory" move, they generally follow along, at times rather frantically. These egrets seldom wade in water. One individual, in fact, was observed flying to perch on a cow as she forded a stream. Birds, as a rule, prey on insects flushed by the movements and shadows of grazing animals, but they also hunt independently. When stalking, a bird makes wriggling undulations of the neck, perhaps the better to sight prey. After a short quick chase, the egret seizes a victim in its bill. Grasshoppers and crickets are the chief insects consumed; lesser items in the diet include spiders, centipedes, earthworms, frogs, and lizards. Cattle Egrets also often feed at garbage dumps.

The Cattle Egret's various croaks and rough barking notes are most frequently emitted during the breeding season; at other times, it is rather silent. If disturbed, it utters a low harsh gargle.

CHANGES: In Texas, as in the larger world, the Cattle Egret's rate of increase during recent years has been exceedingly spectacular. The first individual of certified identity (an immature nonbreeder) was found in Texas near the end of 1955. In May, 1959, the National Audubon Society's heron census in Texas revealed a grand total of 11 pairs of nesting Cattle Egrets; in May, 1965, the figure was 20,379 pairs. The Cooperative Fish-eating Bird Survey in 1969 found 33,600 individuals along the Texas coast; inland colonies of the species were not counted in this census. The total Texas population in 1972 was estimated to be greater than 100,000 (fide Ray Telfair).

By 1970, Jed J. Ramsey found Cattle Egrets well distributed both coastally and inland in the eastern third of Texas. Reporting in the *Bulletin of the Texas Ornithological Society* for December, 1971, he located major Cattle Egret heronries as follows: 30,000 individuals on Sydney Island (Orange Co.); 2,000 individuals nesting on one of the Vingtune Islands in Galveston Bay (Chambers Co.); 800 and 3,000 breeders, respectively, in two colonies near the north entrance



to the Baytown tunnel (Harris Co.); 1,500 nesting on North Deer Island (Galveston Co.); 5,000 breeding three miles east of East Bernard (Fort Bend Co.); 2,000 nesting on the west side of Eagle Lake (Colorado Co.); 2,000 occupying the heronry at Warren Reservoir near Hockley (Waller Co.); 9,000 breeding at Ennis (Ellis Co.); 2,000 nesting two miles north of Cedar Lane and 1,500 in another rookery six miles east of Wadsworth (both localities in Matagorda Co.); 3,000 birds, most of them probably nesting, in the vicinity of Cayuga (Anderson Co.). Ramsey further states that in 1970 there were at least 71,000 Cattle Egrets within the area encompassed by his study.

The year 1971 saw *Bubulcus ibis* still on its rocket-like climb. In the Warren L. Ranch rookery (western Harris Co.) nesting individuals increased from 250 in 1970 to 3,000 in 1971. A whopping 10,000 bred both years at the Rosenberg heronry (Fort Bend Co.).

Why is *Bubulcus ibis* so phenomenally successful? Apparently because man is converting most of the planet into cutover cow pastures and garbage dumps. The majority of wildlife species cannot tolerate this alteration, but the Cattle Egret is programmed to thrive in this newly created habitat. This heron's favorite cow pastures are relatively nontoxic; nobody risks poisoning his cattle by spraying their grass. In short, this little heron is taking advantage of the worldwide paradise man is creating for it.

DETAILED ACCOUNT: ONE SUBSPECIES

AFRICAN CATTLE EGRET, *Bubulcus ibis ibis* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Long decomposed back plumes reaching beyond tail and shorter similar feathers on pileum, nape, and breast vinaceous buff to pinkish cinnamon; remainder of plumage white. Bill, inside of mouth, eye-ring, and loreal region yellow or yellowish brown; iris straw yellow; feet brownish yellow or yellowish brown, soles darker, and claws black. At peak of nuptial pairing, bill dull ruby scarlet with bright yellow tip; lores bright magenta; iris pinkish scarlet or ruby; legs magenta verging to dusky brown on feet. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, including unfeathered parts, but dorsal and pectoral plumes absent; crown with only short pinkish cinnamon crest. *Adult female, nuptial:* Acquired by partial prenuptial molt. Like nuptial adult male, but wing and tail shorter; plumes of pileum, nape, breast, and back fewer and shorter, those of back not reaching end of tail. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but dorsal and pectoral plumes absent; pinkish cinnamon crest paler, shorter, and thinner; similar to adult male in winter, but wing and tail shorter; crest thinner, shorter, and paler. *Male, second winter:* Acquired by complete postnuptial molt. Like adult male in winter. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but plumes of head, nape, breast, and back paler, fewer, and shorter, those of back not reaching to end of tail. Tarsi and toes olive; claws olive brown. *Male, first winter:* Acquired by partial postjuvenile molt and wear from juvenile. Like adult in winter, but pileum paler—pinkish buff instead of pinkish cinnamon; legs and feet black or greenish black. *Female, second winter:* Acquired by complete postnuptial molt. Like adult in winter. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult female, but pectoral and dorsal plumes lacking; pinkish cinnamon of pileum paler; legs and feet black or greenish black. Similar to adult female in

winter, but pileum paler. Feet black. *Female, first winter:* Acquired by partial postjuvenile molt and wear. Like first nuptial female, but pileum pinkish buff instead of pinkish cinnamon. Like first winter male, but wing and tail shorter. *Male, juvenile:* Acquired by complete postnatal molt. Like first winter male, but crown light buff instead of pinkish buff. Excepting small light buff area on crown, entire plumage pure white. Bill yellow ocher; lores yellow, iris straw yellow; feet black. *Female, juvenile:* Acquired by complete postnatal molt. Like juvenile male, but wing and tail shorter. *Natal:* Downy plumage entirely white; skin yellowish green. Bill dull black, small tip yellow, base green; inside of mouth yellow; iris yellowish white; tarsi and toes green in front, yellowish green behind.

MEASUREMENTS: *Adult male:* Wing, 231.0–250.0 (average, 241.4) mm.; tail, 90.0–100.0 (94.2); bill (exposed culmen), 54.0–56.0 (54.9); tarsus, 75.0–82.0 (78.6); middle toe without claw, 58.0–66.5 (61.1). *Adult female:* Wing, 226.0–240.0 (233.8); tail, 82.0–90.0 (86.8); bill, 51.5–58.0 (55.5); tarsus, 77.0–82.0 (80.4); middle toe, 58.0–63.0 (60.0).

RANGE: In Old World, from s. Portugal and s. Spain to Cape Verde Islands, Africa, Madagascar, Comoro Islands, Aldabra, Seychelles, and Mauritius, Yemen, e. Persian Gulf (Qatar and Trucial coast), Syria, Iraq, Iran, e. Turkey, and Caspian Sea region. In winter withdraws from Caspian Sea, Iraq, and Iran.

First appeared in New World between 1877 and 1882 in n. South America (present-day Surinam). From this nucleus it has spread northward explosively (arrived in United States in Florida in 1942) and presently (1971) breeds from Minnesota, Wisconsin, s.e. Ontario, and Connecticut, south locally to Texas and Florida, also Imperial Valley of California, thence through Mexico and Central America to Colombia, Venezuela (including Trinidad), and Guianas; also Hawaii (introduced) and West Indies. Postnuptial dispersal is very intense and in all directions; recent (1971) stragglers have been recorded in Idaho and c. Manitoba. In winter withdraws from Canada and most of United States, except Gulf coast and Florida.

TEXAS: *Resident* (largely): Collected north to Ellis, east to Brazos, Waller, and Chambers (exact date unknown), southwest to Calhoun, Aransas, and Hidalgo cos. *Dispersal:* Six specimens: Reeves Co., Lake Balmorhea (3 taken, Oct. 21, 1969, J. F. Scudday; Sul Ross State University collection, nos. 396, 450, 451); Pecos Co., 5 mi. west of Fort Stockton (1 on Dec. 5, 1969, Harold Bacon; Sul Ross collection, no. 354); Jones Co., Water Reclamation Plant (2 males, Oct. 17, 1969, G. A. Newman, original nos., 31, 32; Hardin-Simmons University collection).

NESTING: *Nest:* In willows, tamarisks, other trees growing in or beside rivers, ponds, lakes, or bays; scrub oak, cedar, or yaupon in marshes; mangroves; sometimes in baldcypress swamps with low growth of buttonbush and similar vegetation; many nests, sometimes hundreds, in a single tree or clump of bushes; rough platform, 5–12 ft. above ground, composed of medium to small twigs, sometimes pieces of vine; usually without lining; material added throughout incubation and even after young have hatched. *Eggs:* 2–5; pale blue or greenish blue; unmarked; average size, 44.9 × 33.0 mm.

BLACK-CROWNED NIGHT HERON, *Nycticorax nycticorax* (Linnaeus)

SPECIES ACCOUNT

Night Heron of some authors. A rather small, thick-set, big-eyed heron with sturdy bill. *Adult:* black crown and back; white forehead, cheeks, and two or three inconspicuous slender head-plumes; gray wings, tail; white under parts; black bill; yellowish legs. *Immature:* brown, spotted and streaked with buff; gray-green legs; anticipate confusion with young Yellow-

crowned Night Heron (see below). Length, $25\frac{3}{4}$ in.; wingspan, $3\frac{3}{4}$ ft.; weight, 2 lbs.

RANGE: S. and e. Europe and s. Russia (east at least to Lake Baikal) to Africa (localized pockets), Madagascar, Iran, India, China, Indochina, and Indonesia; also in Western Hemisphere, from extreme s. Canada to Tierra del Fuego. Disperses considerably during postbreeding season. In winter retreats from colder portions of range.

TEXAS: (See map.) *Breeding:* Early Feb. to late July (eggs, Feb. 20 to June 24; full-grown young as early as Apr. 23; newly hatched young as late as June 20; half-grown young as late as July 25) from near sea level to 700 ft.—at least occasionally to about 3,600 ft. Locally common to uncommon and decreasing on upper and central coasts; very irregularly fairly common to rare on lower coast and interior eastern half. Has bred in Randall Co., Buffalo Lake (fide U.S. Fish and Wildlife Service), where scarce in summer; and El Paso Co., San Elizario (3 nests with eggs found, June 23, 24, 1933, A. H. McLellan). *Winter:* Nov. to Mar. Irregularly common to uncommon on and near coast and in Rio Grande delta; scarce to rare elsewhere over southern half and sporadically farther north to Henderson, Dallas, Tarrant, and Denton cos. *Dispersal* (migrants and postnuptial wanderers): Mar. to late Oct.—some migrants to Dec. Common to uncommon in eastern half; rare and unpredictable in western half.

HAUNTS AND HABITS: *Nycticorax nycticorax*, whose scientific name translates as “night raven,” is a largely nocturnal and, therefore, rather elusive heron. It is one of a small group of species whose natural distribution is almost cosmopolitan. The Australian is the only major zoogeographic region lacking this species; here the closely related Nankeen Night Heron, *N. caledonicus*,

replaces it. In both hemispheres, the Blackcrown is found in an assortment of fresh, brackish, or saltwater habitats: wooded swamps near coasts, spruce groves and hardwood forests on offshore islands, prairie cattail (*Typha*) and cottonwood (*Populus*) lakes, and reed (*Phragmites*) or bulrush (*Scirpus*) marshes, as well as some city parks. More than most other herons, this species tolerates some encroachment of civilization around its nesting colonies, but even it has declined in areas of intense development, especially in North America and west and central Europe. The Blackcrown is gregarious at all seasons.

This night heron is distinguished in flight from the Yellowcrown, as well as from most other herons, by its profile. Its neck, rather than being retracted in typical heron fashion, is drawn in so the top of the head and back form one continuous line. On broad, slow-flapping wings, it moves on the average of 18 to 21 m.p.h. Sometimes when landing, it sets its wings and soars or drifts down to the ground. Birds fly from their daytime tree-roosts, usually at dusk, to fishing grounds, where they appear to be territorial. The Blackcrown actively stalks prey or patiently waits for it to appear. It has been observed alighting in deep water to capture prey, then flying off. In algae-covered ponds, it has been seen to partially submerge its bill and imperceptibly (but rapidly) open and close it; apparently this agitation draws aquatic animals. Many fishes—over 50 percent of this heron's diet—are consumed: shad, herring, minnows, carp, catfish, eel, killifish, yellow perch, sunfish, largemouth bass, others. It also eats garter and similar snakes, tadpoles, frogs, salamanders, crayfish, fiddler and blue crabs, shrimp, clams, mussels, dragonflies and other larger aquatic insects, rodents (especially in winter when waters are frozen), and some algae.

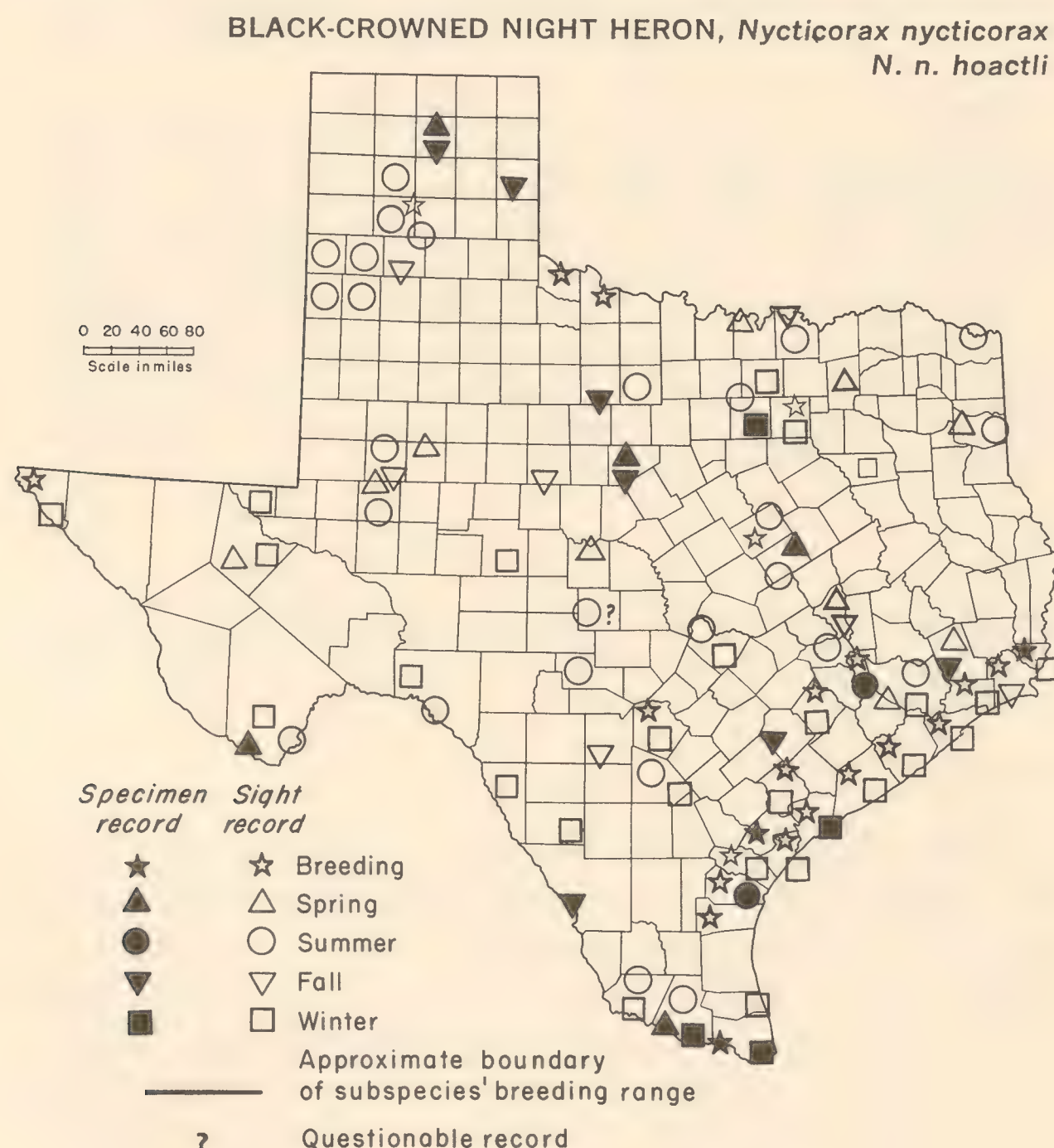
Quock!, the typical note of the Black-crowned Night Heron, also serves as a folk name for the species. This throaty call issues most frequently at dusk and after dark; it is more rapid and higher pitched when sounded in alarm.

CHANGES: The Black-crowned Night Heron has been declining, along with its several habitats, since at least 1939. However, this adaptable species is sinking more slowly than are most other marsh birds. The Cooperative Fish-eating Bird Survey of 1969 encountered 865 Blackcrowns on the upper Texas coast, 900 on the central coast, and 50 on the lower coast. It is the senior editor's opinion that if a similarly complete air and ground count had been made in 1939 it would not have shown a much greater *Nycticorax nycticorax* population.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN BLACK-CROWNED NIGHT HERON, *Nycticorax nycticorax hoactli* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Crown black with metallic greenish gloss; back similar; outer scapulars mostly glossy olivaceous black or metallic greenish slate color; forehead and two or three long, narrow, partly decomposed occipital plumes white; neck pale brownish



drab gray; wings drab edged with drab gray, but inner secondaries, tertials, and tail between hair brown and drab; sides of neck and body pale brownish drab gray; rest of lower parts white, slightly washed with cream color or drab on breast; lining of wing pale drab gray or dull white. Bill black; lores and orbital region yellowish green or dawn gray; iris carmine, nopal red, or vermilion; legs and feet chrome yellow to pale ochraceous buff; claws mars brown, ecru drab, or avellaneous; soles of toes ocher yellow or naples yellow. At peak of nuptial pairing, bill glossy black; lores black; eyelid light green; iris more intense red; legs and feet rose pink. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but long white occipital plumes either shorter or absent. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but white of forehead tinged with drab; black of upper surface duller, less glossy; wings darker and more brownish; foreneck and jugulum more grayish; sometimes one of long occipital plumes is missing. *Second winter*: Acquired by complete postnuptial molt. Resembling second nuptial, but pileum all glossy black; mantle mouse gray, only glossed with green. *First nuptial*: Acquired by partial prenuptial molt. Similar to juvenal, but upper parts, particularly back, bister or olive brown, latter not streaked; sides of head and of neck, as well as lower parts, less, even very little, streaked with brown or drab. Iris brick red or scarlet vermilion. *First winter*: Acquired by wear from juvenal. Similar to juvenal but paler, buffy areas often fading to white. *Juvenal*: Acquired by complete postnatal molt. Crown and back chaetura black or fuscous black; hindneck chaetura drab, broadly streaked with white and several shades of pale buff; rump light drab, streaked or spotted with dull white; upper tail-coverts hair brown, spotted and tipped with dull buff or white; wings between fuscous and hair brown, quills and most of wing-coverts each with terminal spot of white or buffy white, whole wing more or less washed with dull buff; lower parts buffy white, cartridge buff, or cinnamon buff, broadly streaked with chaetura black, chaetura drab, hair brown, and drab; lining of wing similar. Bill light apple green, upper half of maxilla blackish; lores and eyelids light apple green; iris dark yellow, cadmium orange, or dull orange; legs and feet light yellowish apple green; claws grayish brown. *Natal*: Upper parts dark mouse gray or neutral gray; lower parts similar, abdomen paler; skin pinkish buff to fleshy. Bill dull light yellow; iris grayish olive or yellow; legs and feet buffy brown.

MEASUREMENTS: *Adult male*: Wing, 294.9–315.0 (average, 304.0) mm.; tail, 114.0–129.5 (121.7); bill (exposed culmen), (81.5); height of bill at base, 22.1–23.9 (22.9); tarsus, 81.0–90.9 (85.3); middle toe without claw, 70.1–77.5 (73.2). *Adult female*: Wing, 283.9–312.9 (299.2); tail, 105.9–125.5 (116.8); bill, 71.1–78.5 (73.2); height of bill, 21.1–23.9 (21.9); tarsus, 78.0–88.4 (82.3); middle toe, 67.1–77.0 (70.9).

RANGE: S. Washington, s. Idaho, n.e. Montana, s. Saskatchewan, s. Wisconsin, s. Ontario, and s. New Brunswick, south locally through United States to s. Baja California, coasts of mainland Mexico (Sonora to Jalisco on the west; Veracruz on the east), Central America (highly local), Ecuador, Colombia, and Venezuela; also Hawaiian Islands, West Indies, Trinidad, and Tobago. Winters from s. Oregon, n. Utah, and New Mexico, and from s. Texas, Mississippi Valley, Gulf and Atlantic (north to Long Island) states to southern limits of breeding range (including West Indies).

TEXAS: *Breeding*: Collected north to Waller, east to Orange (eggs), southwest to Refugio (eggs) and Cameron cos. *Winter*: Taken near coast northeast to Liberty (Nov. 29), southwest to Cameron and Hidalgo cos.; inland (1 specimen) in Tarrant Co. *Dispersal* (migrants and postnuptial wanderers): Collected outside breeding range north to Hutchinson, west to Brewster cos.

NESTING: *Nest*: In colonies; in wooded swamps, dry woodlands, or marshes, usually in tall tree, sometimes in bush, on ground, or even almost floating in shallow water; bulky and shallow, often poorly built platform of sticks, weed stalks, and rushes; lined with fine twigs, pine needles, vines, or grasses. *Eggs*: 1–8, usually 3–5; oval or ovate to elliptical or cylindrical ovate; pale light bluish green—from glaucous green to pale

fluorite green or bluish white; unmarked; average size, 51.6 × 37.1 mm.

YELLOW-CROWNED NIGHT HERON, *Nyctanassa violacea* (Linnaeus)

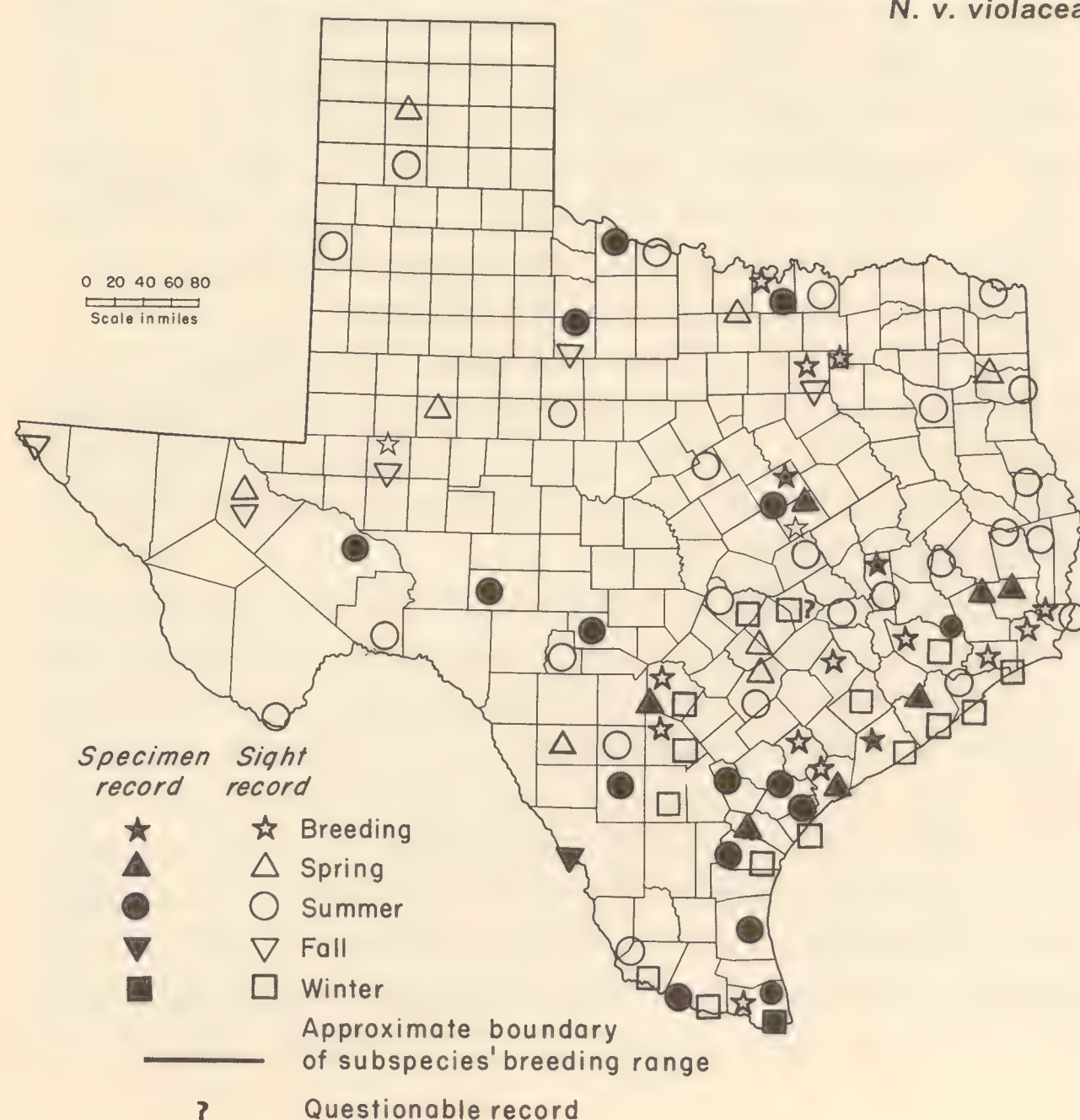
SPECIES ACCOUNT

A stocky heron, reminiscent of the Black-crowned Night Heron, but less stout with slenderer neck; shorter, heavier bill; longer legs (feet and part of tarsi extend beyond tail in flight); shape differences mainly useful for separating immatures. *Adult*: gray body, back and wings streaked with blackish; whitish—usually vaguely yellowish-tinged—crown and elongated head-plumes (2 as a rule); white cheek; black on remainder of head. *Immature*: best told from young Blackcrown by its shape; also by grayish brown (not brown) upper parts with small buffy speckles (not spots and streaks). Length, 24 in.; wingspan, 3½ ft.; weight, 1½ lbs.

RANGE: Oklahoma to Ohio and Michigan (first breeding, 1971), and along Atlantic seaboard from Long Island, south to e. Texas and Florida, thence from c. Baja California (including Sorocco Island and Tres Mariás Islands) and both coasts of mainland Mexico through Isthmus of Tehuantepec, Yucatán Peninsula, and Central America to coasts of South America (Galápagos Islands and Ecuador to mouth of Amazon and e. Brazil). In winter, northern race moves to Gulf states and South Carolina and southward to Panama and West Indies.

TEXAS: (See map.) *Breeding*: Early Mar. to mid-July (eggs, Mar. 23 to June 16; young of all ages, Apr. 20 to July 7) from near sea level to about 700 ft.—at least

YELLOW-CROWNED NIGHT HERON, *Nyctanassa violacea*
N. v. violacea



once to 2,779 ft. Locally fairly common to uncommon on upper and central coasts; locally fairly common to scarce and highly irregular on lower coast and interior eastern half; has bred at Midland (2 adults and 2 young found, July 7, 1969, a few days later, preflight-stage young captured, fide Frances Williams), where casual. *Winter*: Early Nov. to mid-Mar. Locally uncommon to rare in southern third of eastern half—north to Chambers, Harris, Lee, and Travis cos.; west to Bexar, McMullen, and Starr cos. *Dispersal*: July 4 to late Oct. Fairly common to scarce throughout eastern half; rare and unpredictable in western half, though regular in Big Bend since 1967 (fide R. H. Wauer).

HAUNTS AND HABITS: Backwaters in swamps of baldcypress (*Taxodium distichum*), water oak (*Quercus nigra*), magnolia (*Magnolia*), and tupelo (*Nyssa*) are standard haunts for the Yellow-crowned Night Heron in the southeastern United States. However, the species is viable in a diversity of situations: Florida red mangroves, Caribbean tidal flats, dry scrubby islands off the west coast of Mexico, and rugged lavas and basalts of the Galápagos Islands. It is somewhat less migratory than the Black-crowned Night Heron, but birds do move southward from colder northern portions of the range during winter. *Nyctanassa violacea*, generally speaking, is shier, quieter, and less sociable than its cousin night heron.

On the wing, the Yellowcrown is told from the Blackcrown not only by its longer legs but also by its neck, which is folded back more like a larger heron's, instead of drawn in to the shoulders with no perceptible crook. When standing, the Yellowcrown's posture is quite erect. Its big head is often held high—not contracted like that of the almost neckless-appearing Blackcrown. The present species, more than most other herons, shows a decided preference for crustaceans—especially crayfish, also land and fiddler crabs. Lesser items in its diet are frogs, mussels, eels, and aquatic insects; fish are seldom consumed. Foraging by day as well as by night, the Yellowcrown is less nocturnal than its name might imply. Nonetheless, this big-eyed bird is well equipped to feed in dim light, even darkness. In secretiveness, this night heron is intermediate between the large herons and the bitterns.

The call of the Yellow-crowned Night Heron, often sounded in series, is a short *quak* or *vac*; it is frequently heard from birds passing overhead at night. This vocalization is similar to the Blackcrown's but neither so harsh nor so guttural.

CHANGES: The Yellow-crowned Night Heron is dwindling along with its wooded swamps. However, like the bitterns, it is such a hard bird to census that no reliable figures of its population have ever been gathered. The present species uses cover of darkness or dense tree crowns to hide itself. The Cooperative Fish-eating Bird Survey along the Texas coast in 1969, much referred to in the present work, found *Nyctanassa violacea* as follows: 71 on the upper coast, 1 on the central coast, and none on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN YELLOW-CROWNED NIGHT HERON, *Nyctanassa violacea violacea* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Forehead and crown, including most of long narrow head plumes, creamy white (sulphur yellow in life); sides and back of head and upper hindneck glossy black; broad stripe on side of head creamy white; rest of hindneck and mantle slate gray; streaks on wings and on back and shaft streaks on long dorsal plumes chaetura black; lesser and median wing-coverts broadly streaked with light neutral gray; tail slate gray; chin and upper throat glossy black, middle of throat pallid neutral gray; remainder of lower parts light neutral gray to neutral gray; lining of wing neutral gray, edge of wing white. Bill black, but base of mandible sometimes greenish yellow; margins of eyelids and bare space in front of eye olive green or dull yellowish green; iris orange or reddish orange; tibia, posterior part of tarsus, and soles of toes yellow, greenish yellow, or dull orange; fore part of tarsus, with toes and claws, black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults. *Second nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adults, but crown tinged with brown; chin and throat only partly black, median portion gray or dull white; upper surface brown; lower parts somewhat brownish. *Second winter*: Acquired by complete postnuptial molt. Similar to second nuptial but more brownish throughout; occipital plumes less developed. *First nuptial*: Acquired by complete prenuptial molt. Middle of crown ochraceous tawny mixed with brownish black; rest of pileum dull black with short whitish plumes; neck and mantle dull hair brown, back streaked with chaetura black and chaetura drab; wing-coverts and tertials hair brown, lesser coverts spotted and others somewhat edged with dull buff or buffy white; primaries deep neutral gray, secondaries neutral gray; lower parts white, more or less tinged with buff on fore-neck and broadly streaked with chaetura drab and light hair brown; edge of wing white or buffy white; lining of wing hair brown, streaked and spotted with buffy white. *First winter*: Acquired by wear from juvenal, which it is essentially like though paler. *Juvenal*: Acquired by complete postnatal molt. Crown dull black, conspicuously but narrowly streaked with dull cinnamon and buffy white; neck, back, and wing-coverts between fuscous and hair brown with large triangular spots of vinaceous buff; primaries dusky neutral gray to slate color; outer webs of secondaries and both webs of tertials brownish neutral gray; tail similar; lower parts white or buffy white, broadly streaked except on chin and crissum with chaetura drab and hair brown. Bill greenish black, basal part of mandible greenish yellow; iris greenish yellow or pale orange; eyelids and bare space around eye greenish yellow; legs and feet dull yellowish green, front of tarsus with claws brown. *Natal*: Long feathers of pileum white but with gray bases; rest of upper surface pale gray or grayish white; skin pinkish buff to fleshy. Bill grayish; iris grayish olive; legs and feet dull buffy brown.

MEASUREMENTS: *Adult male*: Wing, 280.9–303.0 (average, 293.9) mm.; tail, 105.9–121.9 (114.3); bill (exposed culmen), 68.1–78.0 (72.7); height of bill at base, 22.1–26.9 (23.9); tarsus, 93.5–109.0 (101.1); middle toe without claw, 57.9–64.0 (61.2). *Adult female*: Wing, 268.0–294.1 (285.8); tail, 103.1–113.5 (108.7); bill, 64.0–74.4 (69.3); height of bill, 21.1–25.9 (22.9); tarsus, 95.5–108.5 (100.8); middle toe, 52.1–63.0 (59.7).

RANGE: Locally from Oklahoma to Ohio and Michigan, and along Atlantic seaboard from Long Island, south to e. Texas and Florida, thence on Gulf coast of Mexico and through Isthmus of Tehuantepec and Yucatán Peninsula to Panama. Winters from s. Texas and e. South Carolina throughout remainder of breeding range; also widely in West Indies.

TEXAS: *Breeding*: Collected north to Cooke, east to Falls and Hardin, south to Harris, Matagorda (eggs), Victoria, and Cameron, west to Bexar cos. *Winter*: Three specimens: Cameron Co.,

Brownsville vicinity (Jan. 8, 19, 1912, A. P. Smith; Feb. 21, 1894, F. B. Armstrong). *Dispersal*: Collected in Wilbarger (Aug. 19), Haskell (Aug. 19), Sutton (July 22), Kerr (July 4), La Salle (Aug. 3), Webb (Sept. 20), and Pecos (June 20) cos.

NESTING: *Nest*: In swamps or marshy woodlands; in top of tree, or in tall bush; rather frail platform of sticks, though sometimes bulky; lined with small twigs and leaves. *Eggs*: 3-6, usually 4; elliptical to oval or ovate; smooth; pale greenish blue, pale bluish green—from pale glaucous green to pale olivine; unmarked; average size, 51.3×36.8 mm.

AMERICAN BITTERN, *Botaurus lentiginosus* (Rackett)

SPECIES ACCOUNT

A protectively colored heron, rather small and stout, with yellowish bill; yellowish green legs; in flight, reveals blackish flight feathers. Buff-tipped brownish above with rusty crown; heavy black stroke on side of neck; whitish throat; brown- and buffy-streaked below. Length, $25\frac{1}{2}$ in.; wingspan, $3\frac{1}{2}$ ft.; weight, $1\frac{1}{2}$ lbs.

RANGE: C. British Columbia, s. Mackenzie (Great Slave Lake), n.e. Manitoba, c. Quebec, and Newfoundland, south to s. California, c. Arizona, Oklahoma, Tennessee, Ohio, and Virginia, farther south locally in e. Texas, Louisiana, and Florida. Winters from s. British Columbia, Pacific and Great Basin states, Oklahoma, Ohio, and Chesapeake Bay through Mexico and Central America (though rarely) to the Canal Zone; also a few in Bahamas and Greater Antilles.

TEXAS: (See map.) *Breeding*: Early Apr. to late Aug. (eggs, Apr. 13 to May 17; young recorded, Aug. 14) from near sea level to about 1,200 ft. Specific records

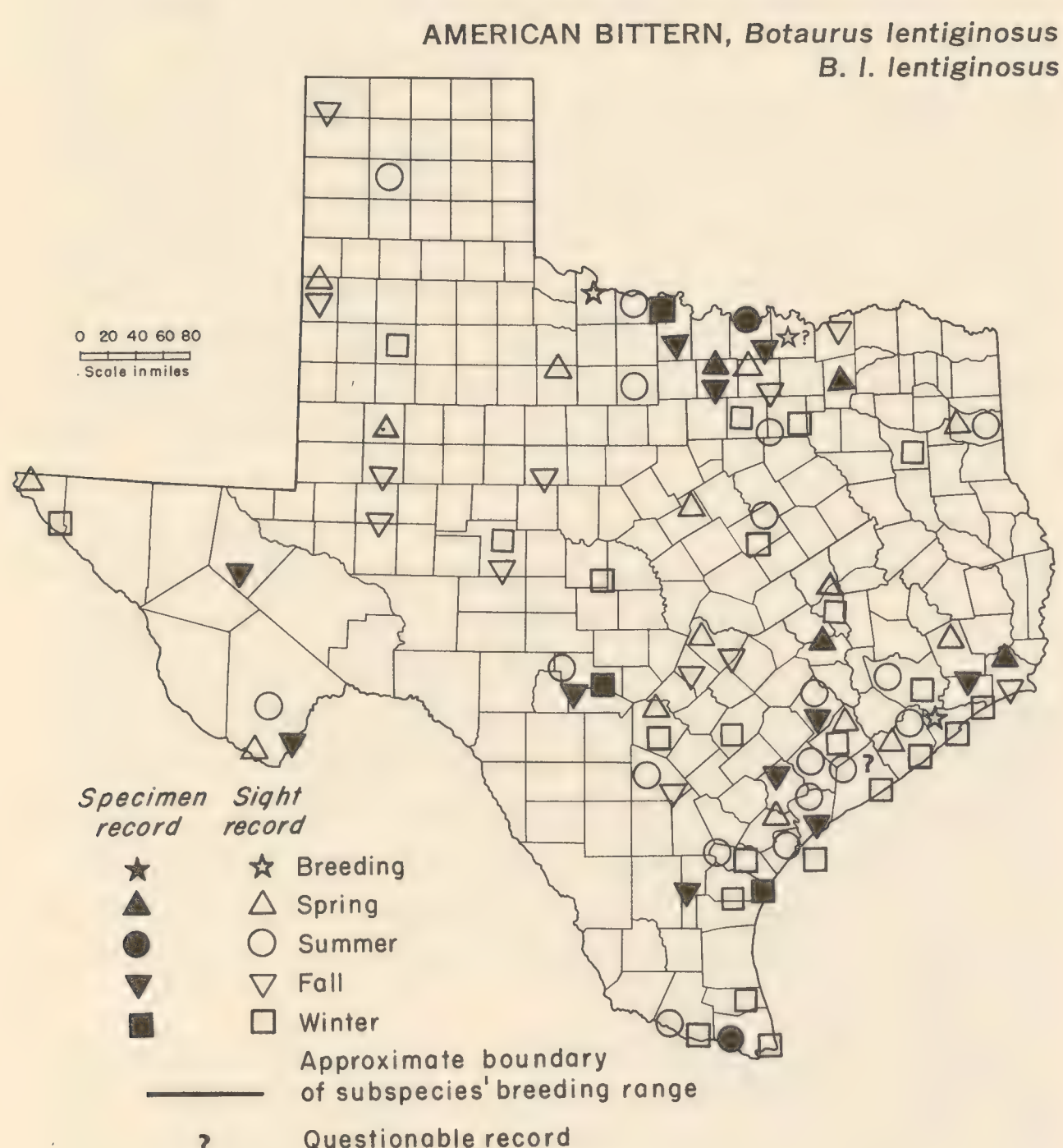
only from Wilbarger Co. (Watt Lake, eggs found, May 2 and 5, 1921, May 4, 1923, May 5 and 17, 1926, and May 5, 1927, R. L. More; near Vernon, eggs found, May 8, 1921, A. J. Kirn, and young seen at pond, Aug. 14, 1931, G. E. Maxon) and Galveston Co. (eggs found, Apr. 13, 1941, T. C. Meitzen). Also said to breed in Grayson Co. (fide U.S. Fish and Wildlife Service). Very rare in summer in eastern half; lingers casually into summer in northern Panhandle. *Migration*: Mid-Mar. to early May; mid-Aug. to late Oct. (extremes: Mar. 22, June 5; July 23, Nov. 20). Locally fairly common—formerly common—to scarce on coast; irregularly uncommon to rare in most of inland eastern half; scarce to rare in western half. *Winter*: Nov. to Mar. Scarce to rare on coast; rare inland over rest of eastern half; casual in western half.

HAUNTS AND HABITS: Across North America, the American Bittern finds sanctuary in cattail (*Typha*) and bulrush (*Scirpus*) swamps and bogs as well as brackish and salt marshes. It is much more solitary and withdrawn than most of its heron relatives and, thus, is seldom seen at any season.

An America Bittern flushes reluctantly, usually with a croak, flies a short distance, then lands on the ground, ordinarily amid stubble, grass, or reeds. When prolonged, flight is firm and direct with rather rapid but stiff wing-beats. In freezing posture, the bittern assumes a rigid, reedlike stance with bill and neck pointed upward; should a breeze rustle the surrounding vegetation, the bird often sways in unison to maintain its camouflage. Usually this stocky bird stands on the ground, since it is a bit too heavy to perch on flexible marsh plants. Foraging is done chiefly at dusk and night at the edge of a pond or in a wet meadow. This stealthy and patient feeder takes aim of spied prey with almost imperceptible movements, concluding the capture with a swift thrust of its bill; it rarely undulates its neck as does the Least Bittern. An assorted diet includes fish, eels, crayfish, a few crabs, many frogs, salamanders, garter and water snakes, water bugs, dragonflies and nymphs, grasshoppers, and small rodents.

The springtime pumping of the American Bittern has earned it such colloquial names as "stake-driver" and "thunder pumper." This call is a series of clicks and gulps followed by a deep, resonant, usually three-syllable belch, described variously as *oong-ka-choonk*, *pump-er-lunk*, *plunk-a-lunk*, *wunklihoo*, etc. During the bird's effort, the head and neck are pushed rather violently up and forward. Because of the ventriloquial quality of this far-carrying vocalization, its source is often difficult to locate. In flight, usually when disturbed, individuals sound an *ok-ok-ok-ok* or *kok-kok-kok*, also a nasal *haink*.

CHANGES: The American Bittern is doubtless declining along with its wetland habitat. However, this bird is too elusive for any serious population estimates, especially in Texas where it is chiefly a silent migrant and winter visitor.



DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN AMERICAN BITTERN, *Botaurus lentiginosus lentiginosus* (Rackett)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage (ochraceous—normal—phase)*: Acquired by partial prenuptial molt and wear from winter plumage. Pileum russet and centers of feathers streaked with fuscous black; hindneck citrine drab or grayish olive, more or less streaked with dull honey yellow; back bister mottled with various shades of buff, tawny, and ochraceous; rump mottled with tawny, ochraceous, and sepia; tail sepia, mottled and tipped with tawny; primaries dark neutral gray; secondaries fuscous, mottled with tawny and ochraceous buff on terminal portions and on inner feathers; wing-coverts citrine, variously mottled and vermiculated with bister and hues of buff and tawny; sides of head like hindneck but more buffy; broad buffy streak extending along sides of neck; below this a broad glossy black stripe; chin and upper throat buffy white, streaked with clay color; remainder of lower parts pale buffy with broad streaks of clay color which are mottled and narrowly bordered by sepia; lining of wing dull buffy ochraceous, mottled with pale fuscous; axillars with light buff, and edge of wing whitish. Upper parts of maxilla and most of cutting edges olivaceous black, remaining portion of bill yellow, yellowish green, or yellowish white; lores and eyelids lemon yellow; iris sulphur yellow or maize yellow, orange externally; legs and feet olive yellow, bright yellow, or yellowish green; soles of toes maize yellow; claws drab or light brown. *Adults, nuptial (grayish phase)*: Similar to ochraceous phase, but pileum and back fuscous, markings on neck and lower parts much more grayish or whitish; streaks below grayish hair brown, pinkish buff, and cinnamon buff. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but upper parts more ochraceous and buffy; lower surface darker. *First nuptial*: Acquired by wear from first winter, which it resembles but is lighter and more grayish. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, except for wings and tail retained from juvenile. *Juvenile*: Acquired by complete postnatal molt. Crown and mantle bister, the latter mottled with tawny and ochraceous; hindneck mixed ochraceous tawny and cinnamon brown; sides of head and neck ochraceous tawny; lower parts dull ochraceous buff, heavily streaked, except on crissum, with ochraceous tawny and cinnamon brown. *Natal*: Upper parts clay color mixed with sepia; lower parts light cinnamon buff. Bill flesh color; iris yellow; legs and feet greenish flesh color.

MEASUREMENTS: *Adult male*: Wing, 255.0–285.0 (average, 264.7) mm.; tail, 80.0–100.1 (88.6); bill (exposed culmen), 68.1–80.0 (73.7); height of bill at base, 16.5–18.0 (17.3); tarsus, 86.1–99.1 (94.7); middle toe without claw, 77.0–84.1 (81.3). *Adult female*: Wing, 238.1–258.0 (241.0); tail, 75.9–88.9 (81.8); bill, 65.0–74.9 (69.8); height of bill, 15.0–17.0 (15.7); tarsus, 81.0–93.0 (85.9); middle toe, 70.1–79.0 (74.2).

RANGE: S. Mackenzie (Great Slave Lake) and n.e. Manitoba to Newfoundland, south to Colorado and Virginia, locally farther south to e. Texas, Louisiana, and Florida. Winters from Oklahoma and Chesapeake Bay through Mexico and Central America (rarely) to the Canal Zone; also a few in Bahamas and Greater Antilles.

TEXAS: *Breeding*: No specimen, but records of breeding considered to be of this race (see species account). *Migration*: Collected north to Cooke, east to Jefferson, south to Cameron, west to Kerr cos. Additional specimens from Clay and Brewster cos. not identified as to race. *Winter*: Two specimens: Kerr Co., Ingram (Feb. 21, 1915, A. P. Smith); Nueces Co., Corpus Christi (Dec., year unknown, F. B. Armstrong). One specimen from Wichita Co. not identified as to race (Dec. 11, 1958, W. W. Dalquest; Midwestern University collection, no. 18037).

NESTING: *Nest*: In swamps, marshes, thickets, or even hayfields, usually on ground or in low cattails or rushes, sometimes in bush or tree, usually amid marshy vegetation, sometimes part-

ly in water, occasionally on bare ground; rather flat platform, sometimes floating, made of coarse grasses, reeds, flags, sticks, and leaves of bushes, sometimes lined with grass. *Eggs*: 3–7, usually 4–5; oval to elliptical ovate; olive brown, brownish drab, isabella color, pale or deep olive buff; unmarked; average size, 48.8 × 36.8 mm.

PACIFIC AMERICAN BITTERN, *Botaurus lentiginosus peeti* Brodtkorb

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. l. lentiginosus* but larger, particularly tarsus; upper surface more yellowish (less grayish) buff and paler; top of head more reddish brown; sides of head brighter and more yellowish (less buffy or grayish); lower parts brighter and more tawny or buffy, stripes less clay colored (more tawny).

MEASUREMENTS: *Adult male*: Wing, 266.7–285.0 (average, 275.9) mm.; tail, 83.1–95.0 (89.7); bill (exposed culmen), 71.9–82.0 (78.0); height of bill at base, (17.0); tarsus, 88.4–103.1 (97.8); middle toe without claw, 81.0–88.4 (84.3). *Adult female*: Wing, 240.0–262.1 (247.4); tail, 77.0–91.4 (85.1); bill, 66.0–71.9 (69.1); height of bill, 14.5–17.0 (15.2); tarsus, 82.0–90.9 (86.1); middle toe, 73.9–85.6 (79.5).

RANGE: C. British Columbia, south to s. California and c. Arizona. Winters from s. British Columbia and s. Idaho to s. Baja California and mainland Mexico (locally) to Guatemala.

TEXAS: *Winter*: One specimen: Reeves Co., Pecos River near Pecos (Nov. 28, 1930, B. Kittle; bird had been banded in Idaho, Bonner Co., Algoma Lake, July 18, 1930, W. H. Ransom).

LEAST BITTERN, *Ixobrychus exilis* (Gmelin)

SPECIES ACCOUNT

A tiny elusive bittern. In flight, light phase birds show distinctive upper wing pattern: buffy coverts contrasting with russet secondaries and slaty primaries. *Adult male (light phase)*: greenish black crown, back, tail; brownish sides of face and neck; whitish throat, stripe on scapular region; buffy below. *Adult female (light phase)*: mouse gray forehead; dull black crown; brown back; two whitish stripes on scapulars; finely black-streaked on throat and neck. *Immature (light phase)*: resembles female, but lighter above; more heavily streaked below. *Dark ("Cory's") phase*: light areas of head, neck, wings, and under parts replaced with russet; throat dark buff instead of whitish. Length, 13½ in.; wingspan, 17¼; weight, 3½ oz.

RANGE: Locally in s.e. Oregon, California, and n. Baja California (perhaps Nevada and Utah), and from extreme s.e. Manitoba, Michigan, and s. New Brunswick, south to e. Texas and Florida, thence locally through mainland Mexico, Central America, and South America (predominantly east of Andes) to Bolivia, Paraguay, and s. Brazil; also Greater Antilles. Northern races winter chiefly in s. California and Baja California, and in coastal Texas, s. Florida, and Bahamas to Colombia; apparently largely resident in Greater Antilles and South America.

TEXAS: (See map.) *Breeding*: Early Apr.—occasionally in late Mar.—to mid-Aug. (eggs, Apr. 13 to July 20; young in nest, June 9 to Aug. 13) from near sea level to about 3,760 ft.—at least formerly. Locally

fairly common to uncommon on upper coast; irregularly uncommon to scarce on central and lower coasts and in Rio Grande delta; very rare and irregular in remainder of eastern half. Formerly bred over wider range to Bexar (last record, 1933), Medina (last, 1925), Wilbarger (last, 1928), and El Paso (last, 1946) cos. Casual in summer in Big Bend and Panhandle. *Migration*: Mid-Mar. to late Apr.; early July to late Sept.—occasionally to late Oct. Fairly common to uncommon near coast; locally uncommon to rare in most of interior eastern half; casual in Trans-Pecos and Panhandle. *Winter*: Nov. to Mar. Very rare on coast and in Rio Grande delta. Formerly rare in El Paso region.

HAUNTS AND HABITS: The Least Bittern, smallest of the North American Ardeidae, skulks persistently in freshwater marshes of cattail (*Typha*), arrowhead (*Sagittaria*), and buttonbush (*Cephalanthus*)—sawgrass (*Cladium*)—smartweed (*Polygonum*), or in similar vegetation. It also occurs in brackish and salt marshes; the latter place, however, is probably used more as a stopover during migration than as a nesting area. Most Least which breed in eastern Texas apparently drop into Mexico and points southward during cold months, although a few winter in the Rio Grande delta.

A flushed bird, reminiscent of a rail, flutters up weakly, with neck craned and legs dangling, barely above vegetation. Soon it drops again to cover. Long-distance flight is strong and direct. These tiny birds then fly in typical heron fashion—head drawn in and legs stretched behind. When disturbed, a bittern often freezes into a reed posture; with bill turned skyward and feathers tightly compressed, it mimics the vegetation amid which it lives. A freezing bird is able to

watch an intruder approach from either side or front, since bitterns, to a greater degree than most birds, can direct their eyes sideways or forward. Some frightened individuals, instead of freezing, choose to flee. By compressing its body laterally, the bird eases through the marsh with great dexterity and speed.

Feeding largely in dim light, the Least Bittern fishes on banks of shallow marsh ponds. As it eyes the water, it undulates its lower neck and inches its head farther and farther forward. Suddenly, with a thrust of the head, the bird seizes a tiny fish in its bill, swallows it head first, then darts into cover. Soon the Least emerges at a nearby pond and repeats its fishing operation. Thus, it moves through the marsh generally making one capture per pool. *Ixobrychus exilis* also preys on frogs, tadpoles, salamanders, leeches, slugs, crayfish, dragonflies, aquatic bugs, and rarely a shrew or mouse.

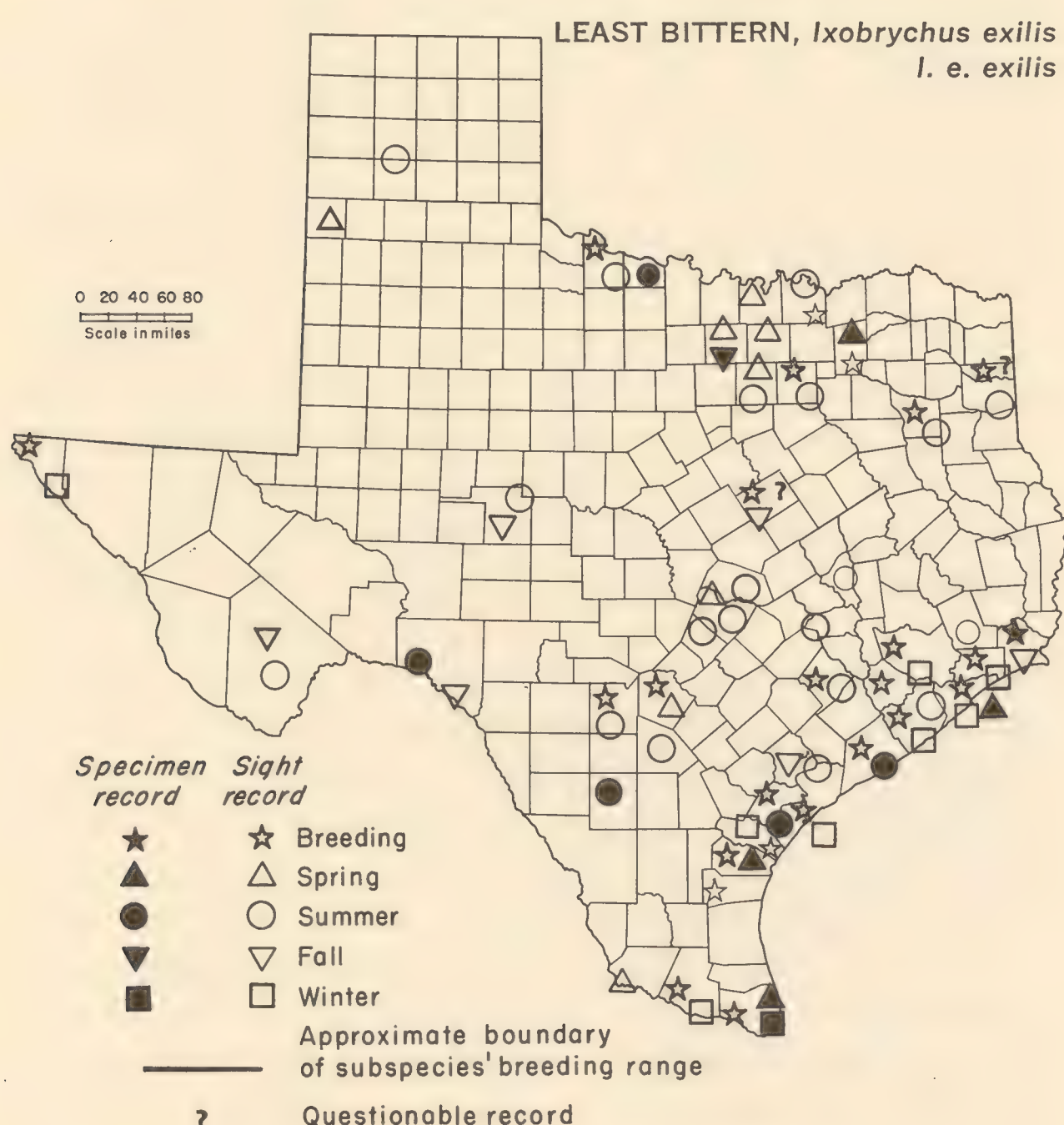
The spring vocalization of the male Least Bittern is a throaty, dovelike *uh-uh-uh-oo-oo-oo-oo-ooah*; the female replies with a shorter *uk-uk-uk*. Loud cackles or a *quoh* are sounded by an alarmed individual, as well as a hissing *hah* if it is disturbed at the nest. Sometimes birds sound a brief series of *coo*'s.

CHANGES: The Least Bittern's marsh habitat has been under attack by mosquito controllers and other pushers of "progress" throughout the twentieth century. This secretive bird has declined, but no one can say by what percentage. In 1969, the Cooperative Fish-eating Bird Survey found 26 of these bitterns on the upper Texas coast, 11 on the central coast, and zero on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN LEAST BITTERN, *Ixobrychus exilis exilis* (Gmelin)

DESCRIPTION: *Adult male, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Pileum, back, scapulars, upper tail-coverts, and tail black with metallic dull olive green gloss; hindneck and superciliary stripe chestnut; wing-quills fuscous, margins of inner secondaries bright russet, lesser wing-coverts varying from cinnamon buff to clay color, median wing-coverts tawny; broad stripe along outer edge of scapulars white or buffy white; tips of primaries tawny or buff; sides of head cinnamon; lower parts white, washed with buff; broad stripe on foreneck cinnamon buff; patch on sides of breast chaetura black; lining of wing mixed light cinnamon buff and white. Culmen dark olive brown, seal brown, or black; cutting edges and base of maxilla and bare frontal space olive yellow or ochre yellow; mandible pale yellow, white, or flesh color; bare space below eye olive buff; eyelids green; inside of mouth and tongue white; iris straw yellow, primrose yellow, or white; legs sage green or olive buff in front, chrome yellow or naples yellow behind; toes wax yellow; soles of toes deep chrome, claws mummy brown, mars brown, or sepia. *Adult male, nuptial (dark—"Cory's"—phase):* This plumage was described in 1886 by Charles B. Cory as the distinct species *Ardetta neoxena*; however, it is now considered a color phase of *I. exilis*. Acquired by wear from winter. Pileum, back, and tail greenish black with metallic gloss; wing-quills dark plumbeous; sides of head and throat rufous chestnut; remainder of lower parts almost uniform light chestnut, excepting lower tail-coverts and sides which are brownish black; upper wing-coverts chestnut; lining of wing similar but paler. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adult male. *Adult female, nuptial (light phase):* Acquired by wear



from winter. Similar to nuptial male, but crown dull black; back and scapulars bister; under parts more heavily streaked and often with narrow fuscous and cinnamon buff lines; lining of wing darker; region below eye olive yellow. Iris cream white; tarsi lemon yellow behind. *Adult female, nuptial (dark phase)*: Similar to dark phase of male. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adult female. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but crown duller; back and scapulars dark brown; lesser wing-coverts with dark brown shaft streaks; throat and breast more heavily streaked; lining of wing darker. *Male, first winter*: Acquired by wear from juvenal, which it resembles, but feathers of back have few or no buff edgings. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, but lesser wing-coverts with dark brown shaft streaks; throat and breast usually more heavily striped. *Female, first winter*: Acquired by wear from juvenal. Similar to female juvenal, but most feathers of back without buffy margins. *Male, juvenal*: Acquired by complete postnatal molt. Similar to nuptial adult female, but pileum rather lighter; back and scapulars edged or tipped with buff, and stripes on foreneck heavier. *Female, juvenal*: Similar to juvenal male, but head more brownish, and narrow stripes of foreneck more evident. *Natal*: Above cinnamon buff or light cinnamon buff; below white or washed with pale buff. Bill and feet pale grayish flesh color; lores and orbital region pale bluish gray; iris apparently black.

MEASUREMENTS: *Adult male*: Wing, 108.5–123.0 (average, 114.8) mm.; tail, 38.6–42.9 (41.1); bill (exposed culmen), 42.9–

47.5 (44.7); height of bill at base, 8.9–9.9 (9.4); tarsus, 39.9–42.9 (41.4); middle toe without claw, 34.5–39.1 (36.3). *Adult female*: Wing, 109.5–123.0 (114.8); tail, 36.1–39.9 (38.4); bill, 41.9–48.0 (44.7); height of bill, 8.9–9.1 (8.9); tarsus, 39.6–44.4 (41.1); middle toe, 34.0–39.1 (36.8).

RANGE: Locally in s. Montana and Colorado, and from extreme s.e. Manitoba and Michigan to s. New Brunswick, south to e. Texas and Florida, thence locally through e. Mexico to s. Nicaragua (racial status of some Mexican and Central American records remains undetermined); also Greater Antilles. Winters from coastal regions of Texas and in s. Florida, locally to Panama and Colombia; also Bahamas and Greater Antilles.

TEXAS: *Breeding*: Collected northeast to Jefferson, southwest to Matagorda, Nueces, and Cameron cos. (see species account). One summer specimen taken in Wichita Co. (June 1, 1956, W. W. Dalquest; Midwestern University collection, no. 17880) probably of this subspecies. *Migration*: Collected north to Wise, east to Galveston, south to Cameron, west to La Salle (Aug. 11) and Val Verde (Aug. 27) cos. *Winter*: One specimen: Cameron Co., Brownsville (Jan., year unknown, F. B. Armstrong).

NESTING: *Nest*: In marshes and swamps; amid reeds, grass, bushes, cattails, or other marsh vegetation; in low bush or tall reeds, occasionally in tree or on ground; sometimes on floating bog; often over water; well concealed; rather flat on top, and fastened to adjacent reeds; loosely constructed of reeds, twigs, strips of rushes, grass blades, and weed stalks; lined with fine grasses. *Eggs*: 3–7, usually 4–5; oval, slightly elliptical oval, or ovate; bluish white or greenish white; unmarked; average size, 31.0 × 23.6 mm.

Storks: Ciconiidae

JABIRU, *Jabiru mycteria* (Lichtenstein)

SPECIES ACCOUNT

A huge stork with long (12–13 in.), heavy, slightly recurved bill. *Adult*: plumage white; bare skin of head and neck black except for broad red or orange collar at base of neck; bill black. *Immature*: feathers mostly brownish gray; neck skin duller; bill yellowish. Length, 48–55 in.; wingspan (one female), 7¾ ft.

RANGE: Tropical Mexico, south through Central America and South America to n. Argentina. Rare and local north of Colombia.

TEXAS: *Accidental*: First record, of doubtful authenticity: From *Proceedings, Academy of Natural Sciences of Philadelphia*, vol. 19 (1867), under Donations to the Museum: "Durham, George J., Aug. 20th. Head of *Mycteria Americana* [as Jabiru was then known], from Austin, Texas; first ever obtained in the United States." This brief entry was the sole basis for the Jabiru's inclusion on Texas and U.S. lists, but identity and place of collection of this long-vanished head are in doubt (see **CHANGES**). Second record: A single sub-adult seen and photographed well in color on the King Ranch, Kleberg Co., Escondido Lake and vicinity, 7 mi. southwest of Kingsville (Aug. 11–Sept. 8, 1971, H. H. Haucke, W. H. Kiel, Jr.). From its condition and behavior, the bird appeared to be wild; a canvass of U.S. zoos revealed no missing Jabirus. Photo no. 22 in Texas Photo-Record File, Texas A&M University.

HAUNTS AND HABITS: The regal and rare Jabiru is one of the largest flying birds in the New World. On the South American continent only the Andean Condor, *Vultur gryphus*, has a bit wider wingspan and sometimes soars a little higher. It is indeed fitting that this great stork's first verified U.S. occurrence was on Texas' vast King Ranch.

Jabiru mycteria is a generally solitary bird of freshwater or brackish marshes and lagoons. It builds its nest in a very tall tree usually apart from other forest growth. This giant platform, composed of sticks up to five feet in length, is often eight feet in diameter. The female usually lays two eggs; these are grayish or yellowish white and average 73.2 × 58.2 mm.

On the wing, the Jabiru flies with slow wing-strokes interspersed with long glides. It often soars to great heights. In former years when the species was numer-

ous, birds sometimes congregated in large flocks to forage on wet savannahs. During the 1913–14 Roosevelt-Rondon expedition to the Mato Grosso of Brazil, G. K. Cherrie noted as many as three hundred Jabirus at one spot along a pool shore or scattered across an open campo. These storks are drawn to grass fires, where they catch small animals and insects escaping the flames.

The Jabiru is essentially without voice; instead, birds display and express alarm by loudly clapping their mandibles.

CHANGES: Rarely is an author, much less an editor, granted an opportunity to relate change in a species' status from hypothetical to one in good standing on a state or national bird list. Because the human race is incurably addicted to seeing things—usually super-rare birds and flying saucers in the twentieth century, and various kinds of ghosts in preceding centuries—it is necessary to lay down rules for inclusion of species. In the present work, as in most other state bird books, a certified wild bird must have been, without doubt, collected or photographed within the borders of the state. Afterward, the specimen or photograph must have been identified by at least one, preferably more, experts on the species involved.

Actual locality where the 1867 Jabiru specimen (a head no longer in existence) was taken cannot be verified. Perhaps Austin, Texas, was the address of the specimen's donor and not the place where the bird was actually collected. In contrast, the 1971 Jabiru appears to pass the test of a valid occurrence. Both the bird and its photograph have been identified by experts in the wildlife field. Veteran wildlife man Clarence Cottam in his enthusiasm remarked that this Jabiru made the Wood Storks present with it look like chicks!

Although there is no doubt about the identity of this highly distinctive bird, the possibility exists that it could have escaped from captivity. H. H. Haucke and W. H. Kiel, Jr., who observed and photographed the Jabiru frequently, wrote in their manuscript prepared for the *Auk*: "To investigate the possibility that the bird might be a zoo escapee, we sent inquiries to zoos in the United States. No Jabirus were reported missing. In addition, the bird's behavior [i.e., "... bird was wary"] and strong flight made it doubtful that it had been in captivity. Clarence Cottam, Director of the Welder Wildlife Foundation, and David R. Blankin-

ship, biologist, National Audubon Society, accompanied us on different dates to observe the bird. There was no doubt of its identity."

The senior editor, one of those who verified a photograph of the King Ranch Jabiru, is familiar with *Jabiru mycteria* in captivity. Zoos almost always clip the wings of this stork to prevent it from damaging itself in its enclosure or from flying away. It is noteworthy that the recent Texas individual was observed during the very season when wild storks, ibises, and related birds disperse northward from the Tropics.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Apparently worn in winter. Head and neck naked except for tuft of white feathers on back of head; entire plumage white. Bill, naked skin of head and neck, legs, and feet black; lower part of naked neck with a bright red collar, sometimes orange; iris brown. *Adults, non-breeding:* Apparently worn in summer. Similar to nuptial adults. *Second nonbreeding:* Acquired by complete postnuptial molt. Plumage above and below white, except that wings, tips of secondaries, and wing-coverts somewhat spotted with drab gray, drab, and light drab; whole bird much lighter and more whitish than juvenal. *First nuptial:* Similar to second nonbreeding. *Juvenal:* Acquired by complete postnatal molt. Crown and occiput blackish brown or brownish black, tips of feathers lighter; remainder of upper parts much mixed with drab, grayish hair brown, mouse gray, and white, presenting a peculiar spotted appearance; primaries white, but tips slightly tinged with drab gray; secondaries pale silvery gray; wing-coverts much mixed with large spots, sometimes involving whole feathers, of drab gray to hair brown, silvery gray, or white, inner secondaries drab gray terminally; lower surface mostly white, but jugulum drab to hair brown, and thighs mixed with drab, hair brown, and drab gray. Unfeathered parts of head and neck black; bill dark colored, almost black; iris brown.

MEASUREMENTS: *Adult male:* Wing, 620.0–685.8 (average, 646.9) mm.; tail, 205.0–245.1 (235.7); bill (exposed culmen), 279.9–354.1 (314.7); height of bill at base, 63.5–74.9 (69.3); tarsus, 292.1–338.1 (313.7); middle toe without claw, 104.1–119.1 (112.0). *Adult female:* Wing, 609.6–622.3 (613.9); tail, 198.1–241.3 (213.1); bill, 247.6–320.0 (295.1); tarsus, 285.8–304.8 (296.9); middle toe, 106.7–114.3 (110.5).

TEXAS: *Accidental:* See species account.

WOOD IBIS, *Mycteria americana* Linnaeus

SPECIES ACCOUNT

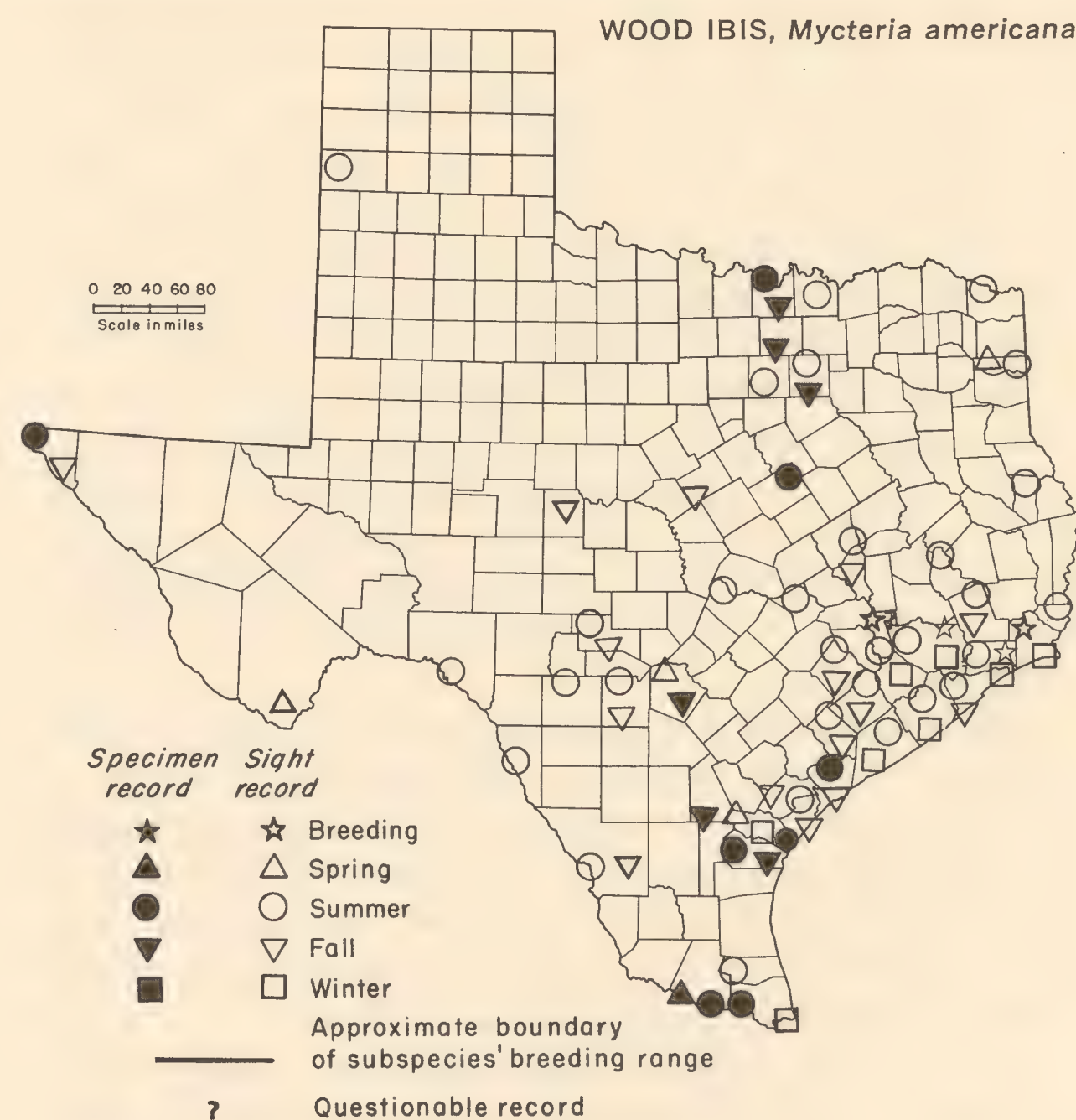
Wood Stork of many authors; Flinthead of colloquial speech. A large white marsh bird with a long sturdy blackish bill, thick at base and mildly decurved toward tip; bald, scaly blackish and yellowish head and upper neck; long blackish legs; in flight, reveals black flight feathers and tail. Length, 40½ in.; height, 3½ ft.; wingspan, 5½ ft.; weight, 10 lbs.

RANGE: Florida (formerly in e. Texas, Louisiana, Georgia, and South Carolina), rarely in Cuba and Dominican Republic, locally on both coasts of Mexico and Central America, and locally through South America to Peru, c. Argentina, and Uruguay. Disperses widely during postbreeding season; in United States, largest numbers occur in South Carolina, Georgia, Gulf states, and s.

California, with stragglers reported from as far north as Montana, Michigan, and New Brunswick.

TEXAS: (See map.) *Breeding:* Three definite sightings: southwestern Jefferson Co., Johnny Pipkin's Big Hill Ranch (ca. 50 breeding adults with nests, eggs, and young—some still somewhat fuzzy—in colony associated with cormorants, Anhingas, Great Blue Herons, Common Egrets, Snowy Egrets, Little Blue Herons, night herons, and Roseate Spoonbills, June 12–July 24, 1960, Corrie Hooks, Bessie Reid, Mrs. Bert Lindsay, Dr. and Mrs. Stuart Wier); Chambers Co., Elm Grove (Wood Ibis nested, 1930, Mrs. Hooks, Mrs. Reid); Harris Co., on San Jacinto River (nesting in July, year unknown, fide S. G. Williams). *Summer:* Late May to mid-Oct. (extremes: Apr. 3, Nov. 30). Irregularly common (very occasionally)—formerly sometimes abundant—to uncommon on upper and central coasts; locally fairly common—formerly very common—to scarce on lower coast and in Rio Grande delta; has wandered rarely (especially July–Sept.) inland in eastern portions of state west to Val Verde, Uvalde, Kerr, Concho, Tarrant, Denton, and Cooke cos.; casual in El Paso region; accidental in Brewster Co., Big Bend Nat. Park (1 seen, May 18, 1962, J. B. Strickling) and Deaf Smith Co., Tierra Blanca Creek (2 seen, ca. June 1, 1876, C. A. H. McCauley). Although most numerous in July and Aug., concentrations occur locally in June (e.g., Nueces Co., 400 or more seen, June 23, 1963, G. W. Blacklock; Hidalgo Co., Santa Ana Nat. Wildlife Refuge, 120 seen, June 14, 1953, Mr. and Mrs. C. T. Gill, L. C. Goldman). *Winter:* Individuals and small flocks linger rarely along coast.

HAUNTS AND HABITS: The only true stork native to temperate North America is the Wood Ibis. The other sixteen long-necked, long-billed, long-legged members



of Ciconiidae occur in tropical and temperate areas throughout the major land masses of the world. Rookeries are sought preferably in large tracts of baldcypress (*Taxodium distichum*), to a lesser extent in stands of red mangrove (*Rhizophora mangle*). The Wood Ibis feeds in prairie ponds, flooded pastures or fields, standing water in ditches, and similar shallow freshwater situations; some feeding also is done in salt water. During postbreeding dispersal, individuals have scattered as far as the U.S.-Canada border. Most intensive wanderings occur after periods of nest failure, due to drought or freeze and resultant food shortage. Some wanderings in recent years may stem from instability among individuals of this much reduced species.

In direct flight, this stork is strong and swift. In good air-thermal weather—i.e., warm sun, clear skies, little wind—usually between 10:00 A.M. and 3:00 P.M., flocks soar and drift upward several hundred feet in circles or interweaving mazes. On other occasions, birds will perch for hours on the uppermost part of a dead tree where they sun and preen between feeding. By day or night, the Wood Ibis forages in shallows for a variety of food: mainly various minnows, killifish, mullets, fiddler and other crabs, crayfish, small alligators, snakes, turtles, tadpoles, frogs, wood rats, mice, shrews, dragonfly larvae, grasshoppers, water beetles, other insects, and bits of plant matter; rarely this stork takes a bird (Audubon recorded young rails and grackles). Usual feeding method is to wade slowly forward with partly opened bill half inserted into water; at times the bird rakes bottom mud with its feet to stir up prey. In water and on land, it walks with stately deliberation and a firm step.

Adult Wood Ibises, practically voiceless, exchange hissing *fizz-z-z's* when birds relieve one another on the nest or when a pair is fussing; this latter hissing sometimes stimulates nearby storks to respond. Mechanical sounds include a *woof* produced by the wings in flight, and mandible clapping during mating and other display. The young are most clamorous. Chicks, from the time they hatch, utter high-pitched nasal *nyah-nyah-nyah's* almost constantly; this gets louder and deeper as the nestling grows. The chorus of young at the rookery creates an enormous din.

CHANGES: *Mycteria americana* has been reduced on its U.S. range by more than 90 percent since 1939 and now apparently nests only in Florida. The Cooperative Fish-eating Bird Survey, late May–early June, 1969, revealed a grand total of 6 Wood Storks along the entire Texas coast; these birds were found by a ground party in the Nueces River delta on June 1, 1969. June is seldom, if ever, a peak month for the species in Texas, but as recently as June 23, 1963, over 400 were seen in Nueces County by G. W. Blacklock.

The source of the several thousand *Mycteria americana* which visited the Texas coast in summer prior to 1940 has always been a mystery. The assumption is that they came from rookeries in Mexico or Florida, or

both. By the 1950's, the closest Mexican habitat which still seemed suitable for Wood Ibis was an extensive marshy savannah south of the Alvarado Peninsula in Veracruz. Here L. Irby Davis and E. B. Kincaid, Jr., found numerous Everglade Kites and Limpkins—associates of the Wood Ibis in Florida—but no nesting or young *Mycteria*. Even in those days, parts of the marsh were starting to be covered with petroleum from gushing and leaking oil wells, and surrounding trees were being rapidly cut and burned. In Florida, lumbering, drainage, fire, ranching, farming, roads, housing developments, and pesticides have dangerously reduced the wooded swamps and extensive wet prairies which the Wood Ibis requires for nesting and foraging.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Worn chiefly in winter. Acquired by wear from previous plumage worn in summer. Head and most of neck unfeathered; plumage white, including long, almost plumelike under tail-coverts; outer webs of tail feathers metallic anthracene purple, inner webs metallic dusky olive green; primaries and secondaries mostly metallic dusky olive green, but grayish basally; mid-portion of wing-lining very pale buff or pink; both wing-quills and tail appear black at a short distance. Bill dull yellowish brown, edges of mandibles yellow; bare head and most of neck dull dark purple and dull yellow, some scales partly blue; iris dark brown; legs dark indigo blue (often blotched with white excrement); feet pink or rose; claws black. *Adults, summer*: Acquired by complete postnuptial molt. Like nuptial adults, but under tail-coverts shorter, not so plumelike. Bill and legs blackish; feet pale flesh color. *Second nuptial*: Acquired by wear from second summer. Like nuptial adults, except for presence of some feathers on neck. *Second summer*: Acquired by complete postnuptial molt. Similar to second nuptial. *First nuptial*: Acquired by wear from first summer. Similar to second nuptial, but entire neck and hind part of head covered, though rather thinly, with dark brown and whitish feathers; white of plumage rather dull; scapulars and tertials more or less tipped with dark brown, and feathers of wings and tail duller. *First summer*: Acquired by wear from juvenal, to which it is similar. *Juvenal*: Acquired by complete postnatal molt. Similar to first nuptial and, like it, with neck and hind part of head largely feathered; wings and tail dull brownish black, with but slight green and purple metallic sheen. Bill considerably yellowish (for at least one year after leaving nest). *Natal*: White; only anterior portion of head unfeathered, this naked skin pale bluish. Bill pale yellow; iris pale bluish; legs and feet yellowish.

MEASUREMENTS: *Adult male*: Wing, 452.1–484.1 (average, 468.4) mm.; tail, 154.9–159.5 (157.7); bill (exposed culmen), 215.1–239.0 (226.6); height of bill at base, 51.6–54.1 (52.8); tarsus, 197.1–214.1 (208.3); middle toe without claw, 102.1–111.0 (107.2). *Adult female*: Wing, 421.9–464.1 (442.7); tail, 132.1–154.9 (146.0); bill, 192.0–208.0 (202.4); height of bill, 47.0–50.0 (48.8); tarsus, 183.1–201.9 (192.8); middle toe, 99.1–104.1 (100.8).

TEXAS: *Breeding*: See species account. *Summer*: Collected north to Cooke, south to McLennan, Calhoun, and Cameron, west to Bexar (Oct. 14) and El Paso cos. *Winter*: See species account.

NESTING: *Nest*: In colonies, in wooded swamps or swampy woods; in tall tree, or in bush, usually over water; rather small and loosely constructed platform of large dead sticks and twigs; lined with Spanishmoss and green leaves. *Eggs*: 2–5, usually 3; ovate to elliptical ovate or elongate ovate; chalky white; without markings, but usually nest stained; average size, 67.8 × 46.0 mm.

Ibises: Threskiornithidae

[GLOSSY IBIS, *Plegadis falcinellus* (Linnaeus)]

SPECIES ACCOUNT

Also known as Eastern Glossy Ibis to distinguish it from the western-ranging White-faced (Glossy) Ibis. Very closely resembles White-faced Ibis (see below); in fact, considered conspecific by many authors. *Breeding bird*: distinguished by lack of white feathers bordering bare facial skin (however, the usually blackish purple loreal skin is briefly bluish white at onset of breeding and may be mistaken as white feathering); metallic green of dorsal wing surface more bluish (less yellowish). *Winter adult*: told mainly by the blackish purple (not reddish) facial area. *Further subtleties*: Glossy has uniformly (not reddish-tipped) grayish black bill; brown (not red) eyes; dark grayish or greenish black (not reddish brown) legs. *Immature*: indistinguishable in the field from young White-faced. Length, 22 in.; wingspan, 3 ft.; weight, 1¼ lbs.

RANGE: C. Florida, Cuba, Hispaniola, and Puerto Rico, also irregularly on Atlantic seaboard from Maine (first breeding, 1972), Connecticut (first nesting, 1971), and New Jersey to Virginia and South Carolina; in Old World, Romania, Bulgaria, s. Russia, Iraq, Iran, e. Africa, Madagascar, India, Burma, Philippines, Java, and s.e. Australia, and sporadically in s. France, s. Africa, and e. China. Wanders habitually during nonbreeding season; in United States, mainly coastally to Massachusetts, Alabama, and Louisiana (rare), probably to Texas. In winter, largely withdraws from areas north of lat. 30° N.

TEXAS: *Hypothetical*: Reported to have bred in Colorado Co., Eagle Lake (nest with 3 eggs found, June 24, 1939, V. W. Lehmann). Numerous occurrence records, many by expert observers, but apparently no specimens or photographs of undoubted identity. Eight specimens in the Dallas Museum of Natural History are labeled *Plegadis falcinellus*; however, all are in winter plumage. Six were collected in Kleberg Co. (all on Feb. 8, 1936, F. Miller, W. A. Mayer); two in Colorado Co. (Feb. 8, 1948, Oct. 5, 1950, collector unknown). Catalog nos. of these questionable specimens: 24, 25, 26, 27, 1819, 1820, 3927, 4828. There is another specimen cataloged as *Plegadis falcinellus* at Texas A&M University; however, it is rather doubtful

that this skin is correctly identified (fide K. A. Arnold).

Both the Glossy and White-faced Ibis lack white on the face in nonbreeding plumages, rendering field identification practically impossible. Ordinarily, the Glossy ranges well to the east of Texas. The paucity of recent reports may reflect more careful observation and better knowledge of field marks, rather than an actual change in the status of *P. falcinellus*. Sightings: Chambers Co., Sandy Point (June 17, 1939, G. G. Williams; many dates in June, July, Aug., Sept., Oct., Nov., Dec., Mar., and May, 1937–1940, singly and in flocks of up to 50, A. K. McKay); Galveston Co. (flocks of 20 or more, 1937, J. M. Heiser, Jr.; flock of 75, July 12, 1938, H. C. Oberholser; single birds, July 5 and 7, Sept. 4, Oct. 9 and 15, 1938, and 10 seen, May 18, 1939, G. G. Williams); Harris Co., below Sheldon (Dec. 21, 1947, J. M. Heiser, Jr.); Waller Co. (3 seen at rookery, summer 1966, A. Sprunt IV, J. M. Anderson); Aransas Co., Rockport (several dates in Mar., Apr., May, June, July, Aug., and Oct., 1936–1940, Connie Hagar); Aransas Co., Aransas Nat. Wildlife Refuge (Mar. 29, 1940, J. O. Stevenson); Midland Co., Midland (May 23, 1954, J. E. Galley); Gray Co., Lake McLellan (Sept. 26, 1954, H. F. Saunders).

HAUNTS AND HABITS: The twenty-two species of sickle-billed ibises include some famous birds—the Sacred, *Threskiornis aethiopica*, of Africa; the Scarlet, *Eudocimus ruber*, of South America; and the Glossy Ibis of world-wide distribution. In view of the present species' extraordinarily wide range in the Eastern Hemisphere, including even isolated Australia, it is somewhat surprising that it is so restricted in the Western. Probably, *Plegadis falcinellus* was a late-comer to America, arriving to find most of its marsh habitat niche already occupied by the White-faced Ibis.

The Glossy flies in typical ibis fashion (i.e., flaps interspersed with glides), not in the spoonbill manner of generally steady wing-beats. Thus, both in bill shape and flight behavior, spoonbills differ from ibises, into which family they are usually merged. The gregarious Glossy Ibis wades in shallows, usually of a freshwater marsh. With its long bill, it probes for crayfish, tadpoles, small frogs, minnows, earthworms, and insects, occasionally a small snake.

Members of a flock, sometimes while feeding, emit grunts which may rise in pitch to a bleat.

DETAILED ACCOUNT: ONE SUBSPECIES

COMMON GLOSSY IBIS, *Plegadis falcinellus falcinellus*
(Linnaeus)

NOTE: It is the normal procedure not to include detailed racial accounts of species which have not been collected within the state; however, *P. f. falcinellus* is the generally accepted New World subspecies, and is the one considered by H. C. Oberholser and the A.O.U. check-list, 1957, to occur in Texas.

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Similar to White-faced Ibis, *Plegadis mexicana*, but lacking any white on feathers of forehead, cheeks, or chin; lores dull greenish or purplish black; upper parts of nearly same shades of metallic green violet and purple; metallic upper surface of wings of more bluish (less yellowish) green tone, particularly on secondaries; neck all around maroon to bay; under parts, except crissum, claret brown to chestnut. Bill dull black, dark grayish brown, or olive gray; bare space on lores plumbeous, purplish black, or dull green, this bare space often outlined by bluish white skin during breeding season; iris dark brown; legs and feet greenish black, dull green, or dull brown. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but crown duller and largely metallic green; sides of head and neck brownish or purplish black, much finely streaked with dull white as is pileum; upper surface of body rather duller in color. *First nuptial*: Acquired by complete prenuptial molt. Practically identical with nuptial adults. *First winter*: Acquired by partial postjuvenile molt, excepting wings, wing-coverts, and tail. Similar to adults in winter but much duller; wing-coverts without chestnut; lower surface of body fuscous, with slight purplish gloss but with no chestnut. *Juvenal*: Acquired by complete postnatal molt. Similar to first winter, but head, neck, and under parts more brownish and with less white streaking anteriorly, this often conspicuous only on head; upper parts very much duller and more greenish and bronzy with much less purple; lower parts much more brownish, with little or no purple sheen and only faint metallic green tinge, also without chestnut. *Natal*: Dull black, usually with white patch on back of crown and a few white bands on throat. Legs and bill dull yellow, bill black at base and at tip, with black band in middle.

MEASUREMENTS: *Adult male*: Wing, 278.9–300.0 (average, 285.8) mm.; tail, 101.1–111.5 (105.1); bill (exposed culmen), 129.0–140.0 (134.4); height of bill at base, 17.5–20.6 (19.3); tarsus, 102.1–114.0 (107.2); middle toe without claw, 62.0–71.1 (66.3). *Adult female*: Wing, 256.0–267.0 (260.6); tail, 96.0–99.1 (97.3); bill, 100.6–111.5 (106.1); height of bill, 16.0–19.0 (17.3); tarsus, 82.0–88.9 (85.9); middle toe, 55.6–60.5 (57.2).

RANGE: Identical with that of species with exception of Philippines, Java, and Sunda Islands to Australia, which region is occupied by the slightly smaller *P. f. peregrinus*.

TEXAS: *Hypothetical*: See species account.

NESTING: *Nest*: Often in colonies; in swamps or marshes, in trees or low bushes, often over water; loosely constructed, shallow platform of sticks, with little or no lining. *Eggs*: 2–4, usually 4; ovate, elliptical ovate, or elongate ovate to rounded oval; uniform light blue or deep greenish blue—niagara green to pale Nile blue; unmarked; average size, 52.1 × 36.8 mm.]

WHITE-FACED IBIS, *Plegadis mexicana* (Gmelin)

SPECIES ACCOUNT

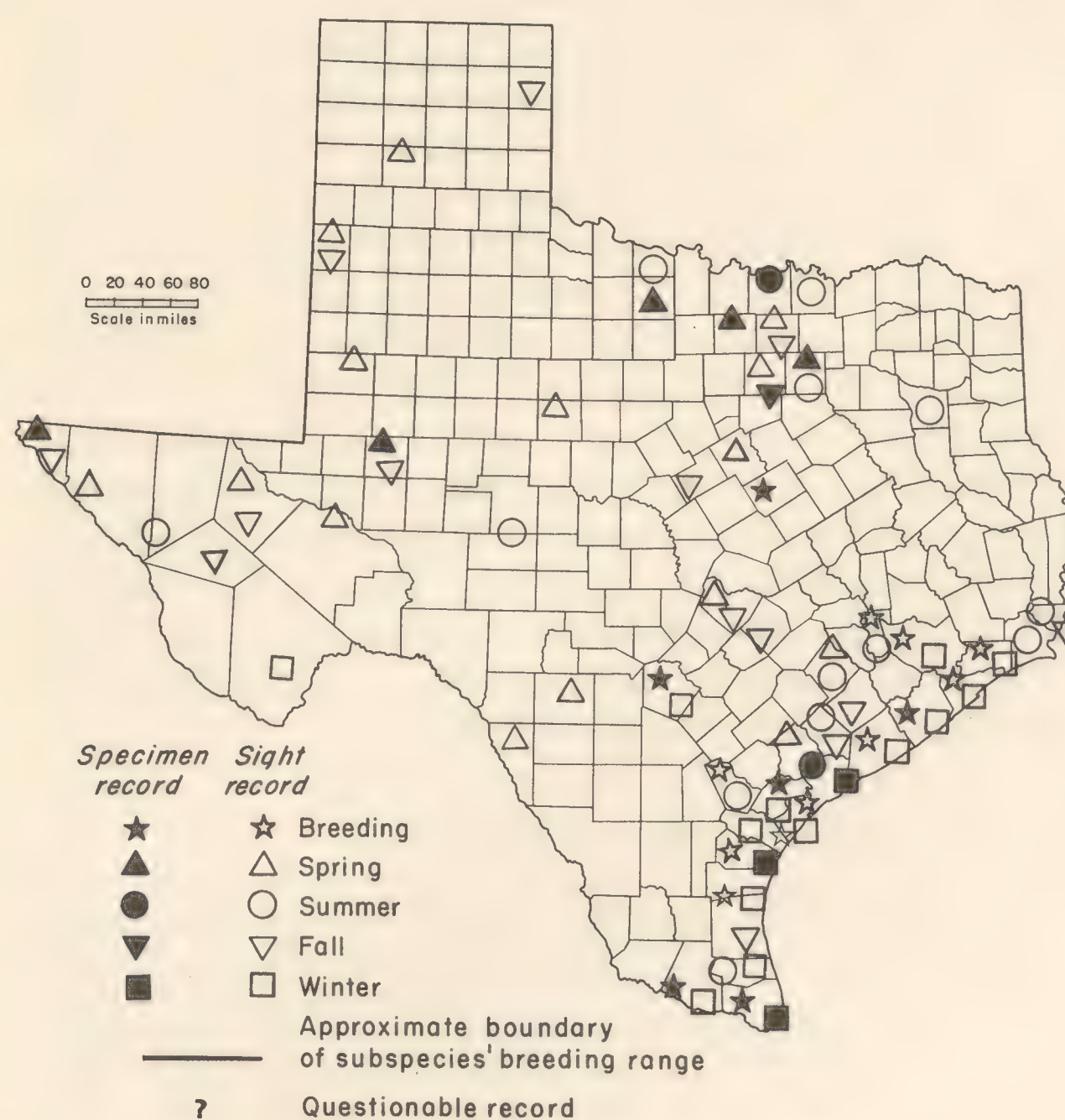
Plegadis chihi of A.O.U. check-list, 1957 (see Appendix A). Considered conspecific with Glossy Ibis by various authors. Also known as White-faced Glossy Ibis. A medium-sized marsh bird with long slender decurved bill. *Adult*: dark maroon, glossed with green and bronze on back and wings; blackish bill with reddish tip; red eyes; reddish brown legs; in breeding

plumage, a narrow white band of feathers extends around eye and under chin, enclosing the bare reddish loreal skin. *Immature*: whitish-streaked grayish brown head and neck; olive-glossed dark brown back, wings; grayish brown below. Length, 22 in.; wingspan, 3 ft.; weight, ca. 1½ lbs.

RANGE: Very locally in s.e. Oregon, c. California, Nevada, and n. Utah, and in coastal regions of Texas and s.w. Louisiana, thence through mainland Mexico to Michoacán and Veracruz; also from s. Peru, s. Bolivia, and s. Brazil to n. Chile and c. Argentina. In winter, population in w. United States largely retreats to s. California and into Mexico; southward withdrawal in Texas and Louisiana noticeable but not complete. Wanders during nonbreeding season, often northward.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, early Apr. to late July (eggs, Apr. 20 to July 2; half-grown young recorded, May 15; two-thirds-grown young, June 30) from near sea level to—at least formerly—about 700 ft. Locally very common to uncommon and declining in rookeries along coast; formerly (prior to ca. 1916) more numerous generally, with breeding colonies inland to Hidalgo (last record of breeding, 1877), Bee (last, 1904), Bexar (last, 1916), McLennan (last, 1900), and Waller (may have nested in recent years) cos. Less numerous in winter, though may remain locally common. *Dispersal*: Scarce to rare—formerly irregularly common to rare—virtually throughout, especially postnuptially.

HAUNTS AND HABITS: The White-faced Ibis prefers freshwater marshes and sloughs and irrigated rice fields to salt marshes. *Plegadis mexicana*, which once bred inland in Texas, is now confined to near-coast rookeries, mostly in what A. C. Bent described as “hog-wallow

WHITE-FACED IBIS, *Plegadis mexicana*

prairies." Nests are in small, formerly large, colonies, often associated with herons, egrets, rails, and gallinules. A good example of a mixed rookery of this type is the protected cattail (*Typha*) lake which provides most of the irrigation water for rice fields near the town of Eagle Lake (Colorado Co.).

From a distance, White-faced Ibises suggest black curlews. Flight on broad rounded wings—neck and legs outstretched—is strong and swift; birds have been clocked at 30 to 33 m.p.h. Periods of wing stroking alternate with brief glides as flocks move in tight groups or diagonal lines. As if constantly trying to coordinate their motions, individuals in an ibis flock make continual altitude and position adjustments relative to others in the party. Sometimes birds will drift high in the air, then, with legs dangling, plunge rapidly downward, checking their reckless descent about fifty feet or so from the ground. With ease they perch or alight on land. In early morning, birds vacate nighttime roosts and fly in their distinctive undulating flocks to feeding grounds; they return again by nightfall. Probing ibises work in shallows or on muddy shores where they extract crayfish, earthworms, and small mollusks. They also catch fish, frogs, newts, leeches, and insects and their larvae.

The seldom heard calls of the White-faced Ibis include a guttural *ka-onk* and a low *kruk kruk*; feeding birds sometimes babble quietly.

CHANGES: Formerly, Gulf coast rice farmers valued the services of the White-faced Ibis, White Ibis, Little Blue Heron, Common Egret, and Snowy Egret; these birds, called "levee walkers," ate crayfish (the crawfish of Southerners), which made holes in the rice irrigation dikes.

However, since 1958, rice growers in Texas, and elsewhere, have engaged in intense application of pesticides. (Strange that rice was grown successfully for thousands of years before the new persistent poisons were invented.) As a result of pesticides—and to a lesser extent herbicides—reproduction of *Plegadis mexicana* is impaired. For example, when over one thousand adults tried to breed at Lavaca Bay (Calhoun Co.) in the spring and summer of 1970, almost no young were raised; lethal concentrations of dieldrin were found in nestlings (H. H. Hildebrand).

The Cooperative Fish-eating Bird Survey, conducted in late May and early June, 1969, found White-faced Ibises as follows: 11,233 on the upper coast, 225 on the central coast, and not one on the lower coast. The total of 11,458 individuals is distinctly remarkable in view of the massive environmental deterioration that has occurred since World War II.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Anterior edge of cheeks and chin and feathers bordering bill on forehead white; head dull metallic corinthian purple with greenish reflections; hindneck and back claret brown to maroon; back and mantle metallic corinthian purple with metallic green reflections, lesser wing-coverts and outer scap-

ulars maroon; primaries metallic dark cress green; secondaries metallic bronzy green, inclining to purple on innermost; tail like mantle; posterior part of chin and all of throat liver brown; remainder of lower parts claret brown with metallic greenish or purplish sheen on some feathers; crissum metallic hays maroon mixed with dark green; lining of wing metallic olive green; axillars similar but partly purple. Bill dark brown or mouse gray, sometimes tinged with reddish; lores, eyelids, and naked skin of chin eugenia red; iris carmine or crimson; bare tibia and tarsus in front, with toes, hessian brown; tarsus behind dark vinaceous; claws fuscous. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head and neck fuscous black streaked with dull white; remaining upper parts duller. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults. *First winter:* (In first winter and juvenal plumages, also to lesser extent in adult winter, this species differs from corresponding conditions of Glossy Ibis, *P. falcinellus*, as follows: upper parts, including wings, lighter, metallic green portions more yellowish or brownish—less bluish; white-streaked parts of head and neck usually lighter, more brownish—less blackish.) Acquired by partial postjuvenal molt. Similar to adults in winter, but upper parts metallic dark greenish olive; lower parts fuscous. Bare part of tibia and tarsus eugenia red. *Juvenal:* Acquired by complete postnatal molt. Upper anterior surface and jugulum fuscous; back, mantle, tail, and upper surface of wings metallic dark greenish olive; chin and throat grayish hair brown; posterior lower parts plain dark hair brown. Bill pale greenish blue or pinkish white, but dull black terminally and basally; iris hazel; legs and feet black. *Natal:* Dull black, back of head with white spot. Bill flesh color, pink or light yellow, base, tip, and middle band black; lores dull black; legs and feet pink, later black.

MEASUREMENTS: *Adult male:* Wing, 260.1–272.0 (average, 264.7) mm.; tail, 95.5–104.9 (98.6); bill (exposed culmen), 127.0–141.5 (135.6); height of bill at base, 17.0–19.0 (18.3); tarsus, 101.6–115.1 (107.7); middle toe without claw, 62.0–70.1 (67.8). *Adult female:* Wing, 235.0–250.0 (240.3); tail, 84.6–97.6 (90.7); bill, 99.6–115.6 (108.7); height of bill, 15.0–17.0 (16.3); tarsus, 82.0–88.9 (84.6); middle toe, 54.1–59.9 (57.2).

TEXAS: *Resident* (fewer in winter): Collected along coast northeast to Brazoria (eggs), southwest to Calhoun and Cameron cos.; formerly inland in Hidalgo (eggs), Bexar (eggs), and McLennan cos. *Dispersal:* Collected in El Paso (May 22), Midland (spring), Archer (Apr. 5), Wise (May 5), Cooke (Aug. 12), Tarrant (Sept. 13), and Dallas (May 3) cos.

NESTING: *Nest:* In colonies; in marshes or swamps; in tules, cattails, rushes, reeds, or bushes, usually over water, but sometimes on ground; rather well made platform of dead rushes, tules, and twigs; lined with fine pieces of rushes and grasses. *Eggs:* 2–7, usually 3–4; ovate, elliptical ovate, or elongate ovate; deep greenish blue or bluish green—from niagara green to pale Nile blue; without markings; average size, 51.6 × 36.1 mm.

WHITE IBIS, *Eudocimus albus* (Linnaeus)

SPECIES ACCOUNT

A medium-sized marsh bird with long slender decurved bill. *Adult:* plumage all white except for black-tipped wings (visible in flight); during peak of nuptial pairing, the pinkish bill (tipped with black), facial skin, and legs turn scarlet. *Immature:* gray- and brown-streaked head and neck; darker brown back, dorsal wing surface, and tail; white on rump and below (including underwings); dusky- and pinkish-mottled bill. Length, 25¼ in.; wingspan, 3¼ ft.; weight, 2 lbs.

RANGE: Chiefly in coastal regions, from c. Baja California, mainland Mexico (excluding Sonora), Texas,

Louisiana, Florida, Georgia, and North Carolina (as of 1971), south on both slopes of Central America to n.w. Peru and c. northern Venezuela; also Bahamas, Cuba, Isle of Pines, Jamaica, and Hispaniola. Demonstrates limited—usually northerly—postbreeding dispersal. In winter, some southward movement from extreme northern edge of range, but apparently largely resident.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, Apr. to July (eggs, Apr. 16 to June 16; young as early as Apr. 20) from near sea level to about 100 ft. Locally very common to scarce and declining along coast; breeds, or has bred, inland in Liberty (1972), Fort Bend (last report, 1939), and Victoria (last, 1930) cos.; perhaps nests in Anderson and Waller cos. Usually less numerous in winter, though concentrations may occur (Galveston Island, 500 seen, Dec. 2, 1950, fide G. G. Williams). *Dispersal:* Wanders inland casually (mostly postnuptially) in eastern half as far north as north central portion; accidental in Brewster Co., Big Bend Nat. Park, Rio Grande Village (1 seen, Feb. 6 or 7, 1971, Mr. and Mrs. Joe Maxwell; 1 found dead, same location—probably same bird—Feb. 8, 1971, P. F. Allan; primaries preserved in park study collection by R. H. Wauer).

HAUNTS AND HABITS: The White Ibis is a bird of coastal salt marshes and nearby fresh or brackish ponds, sloughs, and riverbottom woods. This very gregarious species commonly nests with related species of water birds. If disturbed even slightly, these rookeries are often abandoned; drought or depletion of food are also occasion for relocation. In Texas, colonies occur in stands of baldcypress (*Taxodium distichum*), water oak (*Quercus nigra*), and magnolias, but ibises also nest in pricklypear (*Opuntia*), *Baccharis*, and in tall

grass. During the postnuptial wandering period, stragglers have been sighted as far away as southern California, South Dakota, and southern Quebec.

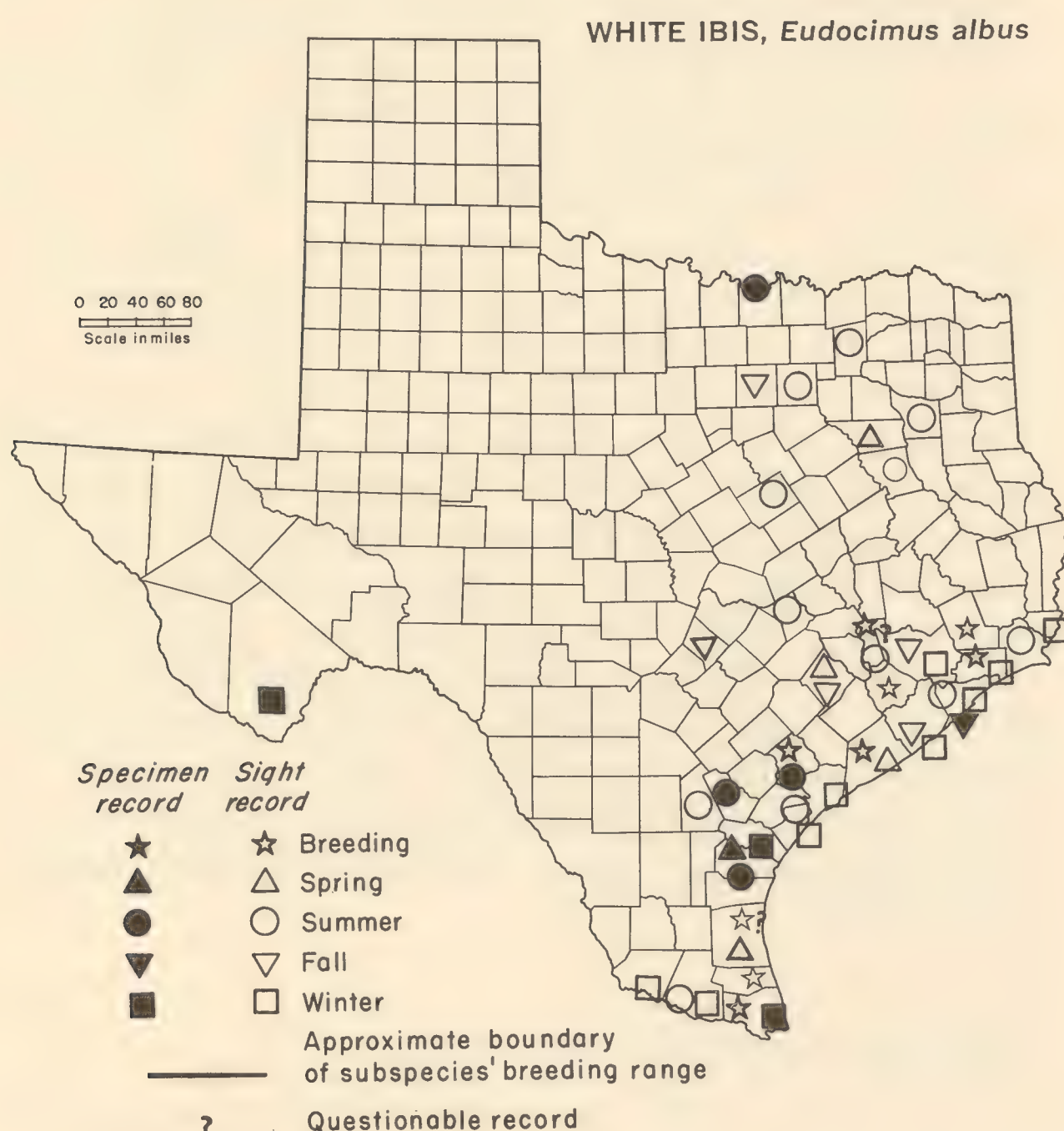
Flight of the White Ibis is strong and swift with rapid strokes varied with graceful short glides. At times, members of a flock beat and sail in unison. Parties, often very large in bygone days, ascend high in the air where they circle and drift. When flying in blue sky these ibises form a dazzling sight as they majestically wheel around, alternately presenting their sunlit white topsides and shadowed undercarriages to the observer.

Birds alight with ease on branches—preferably dead, leafless ones—where they preen and rest. On the ground, the White Ibis walks about lightly and actively. In early morning, birds stream from their roosts to feeding grounds, frequently quite a distance (15 to 20 miles) from the communal area. They return again at dusk in long wavering lines and V-formations, sometimes flying high, sometimes low. In Everglades National Park, 60,000 to 80,000 White Ibises have been observed going to roost, an operation taking three hours.

Where the species is still common, it requires extensive shallows of flats, marshes, or wet fields for foraging. The adult's mainstay is crayfish. Young birds, able to feed themselves, but less skilled than their elders, often settle for slower moving prey, such as fiddler crabs. White Ibises also eat small fish, fish fry, frogs, snails, slugs, small snakes, beetles, grasshoppers, cutworms, water bugs, and other insects. The long decurved bill is useful for probing as well as for snatching prey off the ground or amid grass. The preference for crayfish helps account for a usually healthy fish population where ibises forage, since crayfish feed heavily on fish spawn. White Ibises, along with related water birds, also richly fertilize waters adjacent to their rookeries, much to the benefit of crab, mullet, and other aquatic animal life.

Soft grunts and occasional howling notes are sounded about the nesting colonies. When frightened birds take flight, they utter a harsh loud *urnk urnk urnk* or *hunk hunk hunk*. Otherwise, the White Ibis is rather silent.

CHANGES: The beautiful circling clouds of White Ibis are disappearing from the Texas scene. This species, as well as the other long-legged glamour birds, excepting the Roseate Spoonbill and Whooping Crane, have been counted comprehensively only since 1959. Unfortunately, the various census figures are not readily comparable. Some count only nests, others only mated pairs, others adults, and still others all individuals of a species. The National Audubon Society reported 2,588 nesting pairs of White Ibis in Texas in May, 1959, and 2,315 nesting pairs in May, 1965. Since Robert Porter Allen's studies showed a tendency for there to be about twice as many nonbreeders as breeders, it is here suggested that the total species population during May, 1959, was perhaps about 15,000; and in May, 1965, approximately 13,900. The May, 1969, Coopera-



tive Fish-eating Bird Survey turned up only 4,953 breeding and nonbreeding White Ibises. Not a single bird was observed on the central coast—formerly a stronghold for *Eudocimus albus*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Entirely white, except tips of four outer primaries which are metallic dusky dull bluish green. Bill carmine or orange-red, with tip black or olive; bare parts of head vermilion, turkey red, or orange-red; iris light blue or bluish white; legs and feet light orange, red, or ruddy flesh color; claws brown. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but pileum and hindneck with some spots of brown or gray. Bill, bare parts of head, and legs dull flesh color. *Second nuptial:* Acquired by partial prenuptial molt. Body plumage white, with exception of a few brown feathers, head and neck somewhat mottled with dull brown; otherwise similar to nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *First nuptial:* Acquired by partial prenuptial molt. Head and neck mottled with white and brown; remainder of plumage with varying proportions of white and dark brown, according to stage of molt. *First winter:* Acquired by wear from juvenal. Differs from juvenal in being duller and somewhat paler. *Juvenal:* Acquired by complete postnatal molt. Pileum dull black; hindneck dark hair brown; remainder of upper parts, wings, and tail chaetura drab with faint lighter edgings on mantle; throat and breast dull hair brown with dark shaft streaks; posterior lower parts dull white, more or less washed with hair brown; lining of wing dull hair brown. Bill and bare parts of head dull yellow or flesh color; iris brown; legs and feet black or bluish black. *Natal:* Head black, more or less glossy; back mouse gray; throat and neck brownish black; remainder of under parts pale mouse gray. Bill flesh color, tip black.

MEASUREMENTS: *Adult male:* Wing, 276.1–287.0 (average, 282.7) mm.; tail, 103.1–116.1 (108.7); bill (exposed culmen), 131.0–162.6 (151.4); height of bill at base, 19.6–22.6 (21.6); tarsus, 91.4–104.1 (97.8); middle toe without claw, 61.0–68.1 (65.8). *Adult female:* Wing, 260.1–271.0 (264.7); tail, 94.0–104.9 (98.8); bill, 117.1–129.5 (124.2); height of bill, 17.5–20.1 (19.3); tarsus, 82.0–91.4 (85.9); middle toe, 57.9–62.5 (60.5).

TEXAS: *Resident* (fewer in winter): Collected along coast northeast to Galveston, southwest to Victoria and Cameron cos. *Dispersal:* Two specimens: Cooke Co., Gainesville (Aug. 13, 1879, G. H. Ragsdale); Brewster Co. (see species account).

NESTING: *Nest:* In colonies; in thickets, swamps, and marshes, sometimes on islands; on vines, low trees, mangroves, other bushes, reeds, or rushes, usually about 8–15 ft. above water; substantial, though often flimsy, flat structure of sticks, grasses, roots, leaves, and similar vegetable materials, with somewhat finer materials for lining. *Eggs:* 3–5; ovate, short ovate to elliptical ovate, or elongate ovate; pale grayish white to greenish white or bluish white, rarely yellowish white, even slightly pinkish, cream buff, or pale glaucous green; spotted and blotched with light brown, clay color, and reddish brown, sometimes more numerous at large end, although some are almost entirely unmarked; average size, 56.1 × 37.3 mm.

SCARLET IBIS, *Eudocimus ruber* (Linnaeus)

SPECIES ACCOUNT

Size and shape of the White Ibis. *Adult:* scarlet (not white) with black-tipped wings. *Immature:* virtually indistinguishable from young White Ibis. Length, 23½ in.; wingspan, 3½ ft.; weight, 1¼ lbs.

RANGE: Occurs from n.w. Venezuela, Trinidad, and Guianas to n.e. Brazil (state of Piauí), and in s.e. Brazil (São Paulo and Paraná); however, range insufficiently understood. Apparently resident, but disperses locally during nonbreeding season; stragglers in Texas, Louisiana, and Florida probably largely storm-driven individuals or zoo escapees.

TEXAS: *Dispersal:* Two apparent collection records: Chambers Co., Smith Point (1 shot, Aug., 1955, after hurricane of Aug. 17–20, Forest McNeir, fide Noel Pettingell); Galveston Co., Galveston (1 collected in Sept., 1915, after severe hurricane, fide L. R. Wolfe). Three careful sightings in Cameron Co.: Bahia Grande (1 seen, Oct. 15, 1912, and another during Sept., 1915, both after severe Gulf storms, R. D. Camp); Boca Chica Pass, at lower end of Laguna Madre (flock of 25 first seen, ca. July 15, 1933, H. C. Blanchard, seen by others ca. last week of June, 1933; in Sept., 1933, Blanchard found 2 desiccated carcasses with most of red feathers still adhering, about 3 mi. inland from Laguna Madre).

HAUNTS AND HABITS: The Scarlet Ibis—a chicken-sized bird colored like a Vermilion Flycatcher—seems to impress everybody from sober biologists to ordinary tropical travelers, and even barflies. These ibises, Trinidad's chief tourist attraction, have nested (from 1952 onward) by the thousands in the Caroní Swamp—a great sea-level expanse of mangroves. Here these flaming birds breed alone, but rookeries in northern mainland South America usually contain a few White Ibis intermingled. Behavior of the two forms—often suspected of being color phases of a single species—seems to be identical, but in some regions the Scarlet is perhaps a bit more tied to salt water.

CHANGES: The history of *Eudocimus ruber* in Texas is curious. It has been reported from the state many times, but most of these records have proved to be unauthentic. During the early years of the twentieth century, stores, hotels, restaurants, and taverns throughout the state exhibited mounted Scarlet Ibis. At least one of these moth-eaten, stuffed effigies survived to the mid-1950's in Austin, as witnessed by Charles Hartshorne and E. B. Kincaid, Jr. During the height of the Scarlet Ibis exhibition craze, H. C. Oberholser commissioned H. P. Attwater of San Antonio to travel over Texas to see if any of these birds had been collected locally. Attwater's extensive research revealed that not one of these Scarlet Ibis had been taken in the Lone Star State; thus, scores of supposed specimen records had to be deleted from the Texas list, leaving the occurrence of wild *Eudocimus ruber* in the United States extremely marginal. Zoo captives and recent escapees deprived of their native crabs are usually faded to a dirty pink, but not always. The senior editor recalls a small flock of flame scarlet individuals in the Honolulu Zoo in 1961.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Mostly spectrum red,

verging to scarlet on parts of lower surface and wings, basal portion of feathers of body pink with some light gray down; broad tips of four outer primaries metallic bluish slate black; shafts of primaries and secondaries, except at tips, cream white, basal part of shafts of tail feathers also cream white, under surface of primaries and secondaries, except at tips, between peach red and rose doree. Bill grayish black; bare skin of forehead, lores, and orbital region pale lake red or pinkish; legs and feet red. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults. *Third nuptial*: Similar to nuptial adults, but head and neck paler—peach red to rose red. *Second nuptial*: Similar to third nuptial, but hindneck, throat, and jugulum much mixed with streaks and spots of fuscous, fuscous black, and sayal brown, red areas peach red to dull light scarlet or rose doree, rump and lower back much paler—buff or buffy white, washed or mixed with red; four outermost primaries with metallic bluish black tips of adult, but basal portion of these feathers salmon color; tail red. Bill light brownish. *First nuptial*: Acquired by prenuptial molt. Similar to second nuptial, but head and foreneck buffy brown to dark buffy brown, feathers edged and tipped with dull light pinkish buff, with appreciable wash of dark dull red; hindneck fuscous black washed with dark red, wing-coverts mixed with fuscous feathers; lining of wing mostly dull peach red, more or less mixed with fuscous; tail fuscous,

light brown, or even whitish at base; breast and rest of posterior lower parts pale buffy white or pale buff, washed or much tinged with peach red. *First winter*: Acquired by postjuvenal molt. Similar to first nuptial, but head, neck, and rest of upper parts and wings without red, except for possibly a slight wash and with but a few light orange or whitish feathers in lesser wing-coverts; breast and more posterior under parts dull white, with pinkish or salmon wash; axillars dull white; basal half of fuscous tail dull white. *Juvenal*: Acquired by complete postnatal molt. Upper parts, except lower back and rump, grayish brown; head and neck margined with dull grayish; some tail feathers basally edged with white; rump, lower back, and lower parts white; axillars and lining of wing white or buffy white, former with shaft streaks or mottlings basally.

MEASUREMENTS: *Adult male*: Wing, 250.1–278.1 (average, 266.4) mm.; tail, 85.6–101.1 (93.7); bill (exposed culmen), 145.0–165.1 (155.7); height of bill at base, 20.1–25.9 (22.4); tarsus, 77.5–97.1 (89.2); middle toe without claw, 59.9–65.0 (62.0). *Adult female*: Wing, 231.1–255.0 (242.8); tail, 82.0–97.6 (89.2); bill, 117.1–132.6 (124.2); height of bill, 19.0–21.1 (20.1); tarsus, 73.4–82.0 (77.0); middle toe, 52.6–57.9 (55.3).

TEXAS: *Dispersal*: Two apparent collections (see species account).

Spoonbills: Plataleidae

ROSEATE SPOONBILL, *Ajaia ajaja* (Linnaeus)

SPECIES ACCOUNT

A rather large, colorful marsh bird. *Adult*: mostly pink with white neck and upper back, swathe of carmine on shoulder, and buff orange tail; has long, spatulate, greenish black bill; naked gray-green (usually) head; long pink legs. *Immature*: chiefly white with feathered head, gradually becoming pink plumaged and bare headed; has pale yellow bill and legs. Length, 30 in.; wingspan, 4¼ ft.; weight, 3½ lbs.

RANGE: Locally on coasts of mainland Mexico (excluding Sonora), Texas, s.w. Louisiana, and e. Florida Bay, south through Central America and South America (chiefly east of Andes) to n. Argentina and Uruguay; also Cuba, Isle of Pines, Great Inagua, and Hispaniola. In winter, generally retreats from Louisiana and Sinaloa, with noticeable, but not complete, withdrawal from Texas. Postbreeders scatter northward along watercourses, with vagrants reported as far north as Utah, Nebraska, and Pennsylvania.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, Apr. to July (eggs, Apr. 8 to June 24; young just out of nest, May 2 to mid-July) from near sea level to about 250 ft. Locally common—formerly abundant—to fairly common on upper and central coasts (a few small rookeries some years at inland freshwater lakes in Victoria, Colorado, Waller, and Fort Bend cos.); irregularly uncommon to scarce on lower coast. Occasionally winters in almost summertime numbers along coast (e.g., Chambers Co., Cove, 106 seen, Jan. 31, 1970, A. K. McKay). *Dispersal*: Wanders irregularly, mostly postnuptially, inland as far as Maverick, Medina, Bexar, Travis, Brazos, and Liberty cos.; has occurred in Anderson Co., Dallas-Fort Worth area, and Amarillo vicinity; accidental in Reagan (Big Lake, Aug. 6, 1935, Bessie Reid), and Pecos (see detailed account) cos.

HAUNTS AND HABITS: The few undeveloped islands, lagoons, lakes, shores, and mangrove swamps, mostly on protected refuges, that dot the Gulf coast of Texas, Louisiana, and Florida comprise the fragile northern breeding boundary of *Ajaia ajaja*. This sole New World spoonbill is the only richly hued member of its six-species group. Within its U.S. range, it is the only wild pink bird likely to be seen.

In Texas, nesting occurs on dry coastal islands—even on Intracoastal Canal spoil banks—in *Phragmites* marshes, and in stands of saltcedar-oleander or sea-myrtle-pricklypear cactus-huisache. Here, as in tropical America, the Roseate sometimes shares, or nests adjacent to, rookeries of Wood Storks, ibises, herons, or other large water birds. In Florida, spoonbills nest from November to January. On the freeze-prone Texas-Louisiana coast, however, the Roseate nests in late spring and early summer.

Following the breeding season, a general dispersal of individuals from the nesting areas takes place; in addition, there is a marked northward movement, which studies in Florida have shown to be comprised chiefly (93 percent) of second- and first-year birds. In Texas, Roseates peregrinate in late summer and fall; by winter, most individuals withdraw southward from Texas but return in late February, March, and April.

With deep slow wing-strokes, seldom interrupted by glides, and its long neck, spatulate bill, and legs outstretched, the Roseate flies in linear flocks or V-shaped formations. At times, a group will spiral hawk-like high in the air. The bird's bill is not, as the name

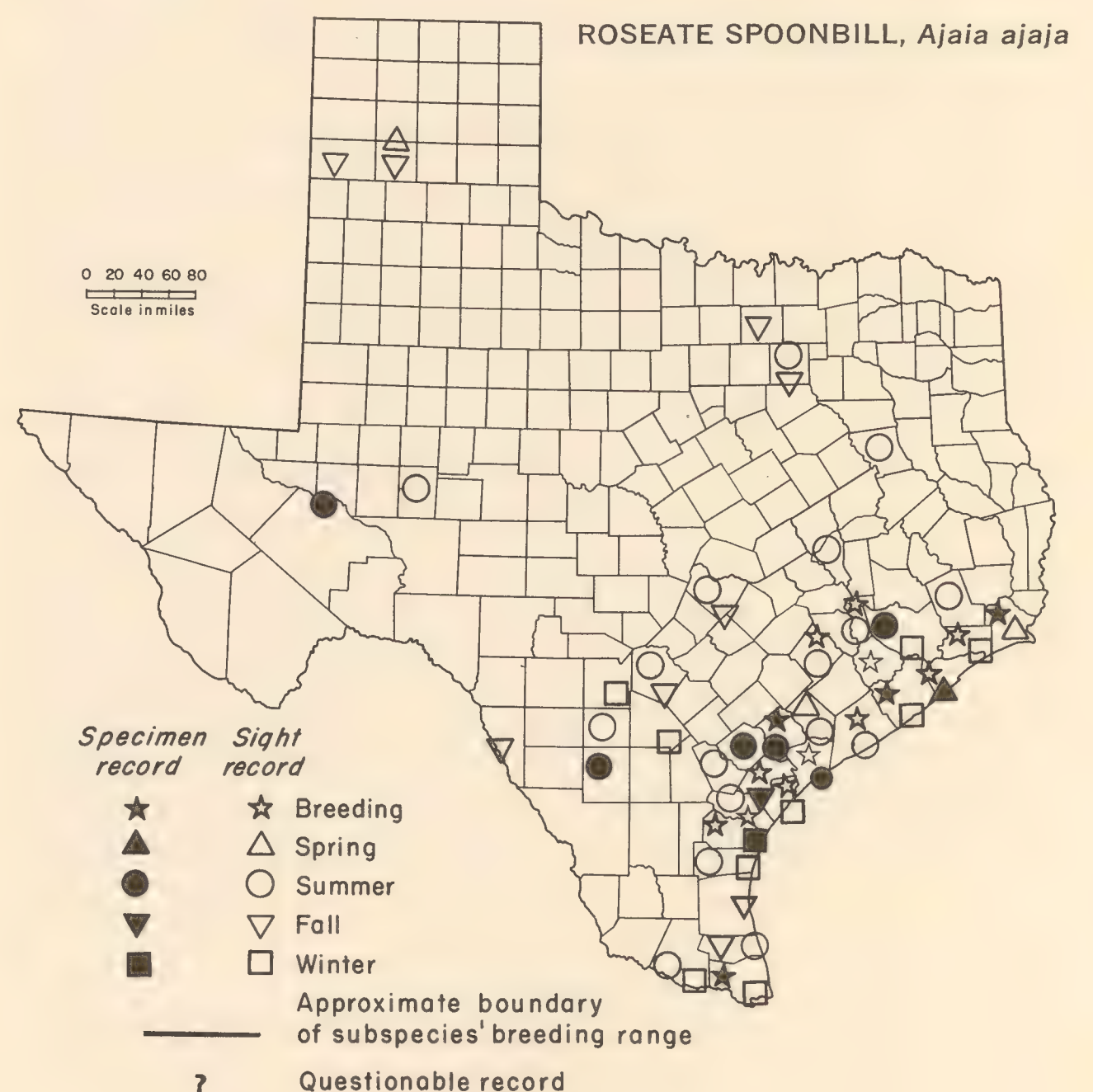




PLATE 3: Sharp-shinned Hawk, *Accipiter striatus*
immature female (top); adult male (bottom) with prey, Rose-breasted Grosbeak, *Pheucticus ludovicianus*

might imply, used as a scoop but as a supersensitive forceps. The network of nerves in the bill allows the bird to feed in clouded water or probe in mud where invisible prey must be felt to be caught. As the Roseate wades in shallows, it swings its partially open spoonbill in lateral arcs through the water and mud; with this scything motion, it seizes minnows—especially silversides (*Menidia*) and sheepshead minnow (*Cyprinodon variegatus*) in Texas—killifish, fish fry, shrimp, water beetles, slugs, and bits of vegetable matter. Sometimes the spoonbill's head and part of its neck are immersed. The bird then raises and slightly shakes its head to guide the food down the bill to the gular pouch, which is about midway down on the lower mandible. At sundown, birds leave the feeding grounds and fly with other water birds to large communal roosts.

The Roseate Spoonbill is, for the most part, a silent bird. In alarm, a low, inquisitive, monotone *huh-huh-huh* is rapidly uttered. Other soft grunting noises are sounded about the nesting colony. The nestlings' distinctive cheeps are thin and high. *Ajaia ajaia* raises its head and opens its bill when vocalizing.

CHANGES: Robert Porter Allen's *The Roseate Spoonbill* gives the history of the species through 1941. During John James Audubon's visit to Galveston in 1837 there were apparently thousands of these birds on the Texas coast.

Roseate wings were in great demand for fans in pre-air-conditioning days; between 1890 and 1919 plume hunters and target shooters almost extirpated the Roseate Spoonbill in the United States. About 1919 the market for wild bird feathers began a long decline.

From May 24 to June 2, 1920, a survey party consisting of T. Gilbert Pearson and Mr. and Mrs. William L. Finley found only 179 spoonbills, none of them nesting, on the central and lower Texas coasts (Matagorda Bay to Port Isabel).

By midsummer of 1941 a remarkable recovery had taken place. There were over 5,000 Roseates and at least five large active breeding sites—Vingtune Islands (Chambers Co.), Green Marsh and Colorado River Swamp (both in Matagorda Co.), Hynes Bay Island (Refugio Co.), and Second Chain-of-Islands (Calhoun-Aransas cos.).

Even more astonishing, in view of the industrial, agricultural, and urban pollution that has mushroomed since 1942, was the spoonbill count in 1968—eight years after the Brown Pelican collapse all along the Texas coast. On May 23 and 24 of that year the Cooperative Fish-eating Bird Survey found Roseates in the number of 2,640 on the upper coast, 1,700 on the central coast, and 130 on the lower coast. This total of 4,470 individuals approaches the all-time twentieth century high of over 5,000 in 1941! Research is badly needed as to why chlorinated hydrocarbons cause massive breakage—at least in California—of Brown Pelican eggs, but not (so far) of the Roseate Spoonbill's in Texas. If anything, spoonbills would seem to ingest more egg-shell-thinning chemicals than Brown Pelicans because

the former catch fish in shallower water where poisons are presumably more concentrated. Perhaps the lighter spoonbills sit less heavily on their eggs. Possibly also National Audubon Society wardens, who have patrolled Texas island rookeries since 1932, guarded the rare spoonbill colonies more carefully than the nest sites of the formerly common Brown Pelican.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Anterior part of head mostly bare; occiput, hindneck (the latter sometimes with carmine streaks), and upper back white, anteriorly with slight pinkish suffusion; back, rump, and wings hermosa pink to la france pink; lesser wing-coverts and upper tail-coverts carmine to rose red; tail light cinnamon rufous, shafts of rectrices eosine pink; foreneck white with slight pinkish tinge; a curly patch on upper breast magenta ruby; side of breast at bend of wing buff yellow, remainder of lower parts, including lining of wing, deep rose pink; thighs and crissum partly rose red. Spoon-shaped bill yellowish gray, but base mottled with brownish black, remainder pale greenish blue, basally greenish yellow; bare space around eye and gular sac orange; bare head skin gray-green, changing to golden buff at pair-forming time, and the posterior border of naked skin black; iris carmine; legs and feet pale lake red, leg-joints and claws brownish black. *Adults, winter*: Acquired by complete postnuptial molt. Practically same as nuptial adults. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but carmine of lesser wing-coverts and roseate tints and carmine markings of body plumage less brilliant and less extensive. *Second winter*: Acquired by complete postnuptial molt. Similar to adults in winter, but carmine or rose red areas on wings nearly or quite absent, suffusion of pink paler, and tail pinkish rather than buff. *First nuptial*: Acquired by partial prenuptial molt. Similar to second nuptial, but head entirely feathered and dull white; tail paler buff; little or no carmine in lesser wing-coverts or upper tail-coverts; broad tips of primaries brown. *First winter*: Acquired by partial postjuvenile molt. Similar to juvenile, but more pinkish and sometimes with a little carmine in upper tail-coverts or lesser wing-coverts. *Juvenal*: Acquired by complete postnatal molt. Head, neck, and upper back white, head entirely feathered; remainder of plumage pale venetian pink but becoming deep pink on rump, lower parts, and wing-coverts, feathers of which are tipped with white; broad tips of primaries hair brown to chaetura drab. *Natal*: White or pink. Skin of body, bill, and feet bright salmon pink.

MEASUREMENTS: *Adult male*: Wing, 341.1–369.1 (average, 350.8) mm.; tail, 93.5–103.1 (98.3); bill (exposed culmen), 153.9–179.1 (168.1); height of bill at base, 26.9–28.9 (28.2); greatest width of bill, 49.0–58.9 (53.8); tarsus, 106.9–123.5 (114.3); middle toe without claw, 75.9–86.1 (80.2). *Adult female*: Wing, 322.1–352.1 (335.0); tail, 85.1–99.6 (94.2); bill, 150.6–162.1 (156.2); height of bill, 24.9–29.4 (27.2); greatest width, 45.0–53.1 (48.8); tarsus, 97.1–107.4 (104.4); middle toe, 70.1–79.0 (74.4).

TEXAS: *Resident* (fewer in winter): Collected along or near coast northeast to Harris and Jefferson, southwest to Victoria, Nueces, and Cameron cos. *Dispersal*: Two specimens: La Salle Co. (Aug. 15, 1939, B. E. Ludeman); Pecos Co., Fort Stockton (Aug. 3, 1863, P. Duffy).

NESTING: *Nest*: In colonies; beside salt bays, brackish or fresh lakes; in marshes, marshy woods, or thickets, usually on mesquite-cactus islands or bare spoil banks; in saltcedars, mangroves, or other woody vegetation, rarely on ground; loose platform, but rather bulky, composed of large sticks with lining of bark strips, moss, fine twigs, and small leaves. *Eggs*: 2–7, usually 3–4; ovate to elliptical ovate or elongate ovate; dull cream color, pinkish white, or pale greenish blue; heavily blotched with various shades of brown, and with shell markings of lavender and drab; average size, 65.0 × 43.7 mm.

[Flamingos: Phoenicopteridae

AMERICAN FLAMINGO, *Phoenicopus ruber* (Linnaeus)

SPECIES ACCOUNT

Roseate Flamingo and West Indian Flamingo of some authors; Greater Flamingo of those who combine Old and New World forms. A tall (stands almost 5 ft.), rubber-necked, spindle-legged, rose pink wading bird; has thick, sharply downward-bent, pinkish beak, tipped with black; in flight, reveals black flight feathers. Length, 45¼ in.; wingspan, 5¼ ft.; weight, 6¾ lbs.

RANGE: Extremely local in Bahamas, Yucatán, Cuba, Hispaniola, islands off coast of Venezuela (Bonaire and Los Roques), and Galápagos Islands; formerly in Lesser Antilles and n. South America from e. Colombia to French Guiana. Disperses during nonbreeding season;

formerly, nesters from n.w. Andros Island moved in great numbers to s. Florida. Recent sightings in United States probably pertain to wanderers from semicaptive colony maintained at Hialeah Park, Florida (E. M. Reilly, Jr.), or escapees from similar confines.

TEXAS: *Hypothetical*: Seven careful sightings on coast, none substantiated by photographs: Cameron Co. (Oct. 15, 1912, and Sept., 1915, both of single birds after severe Gulf storms, R. D. Camp; near mouth of Rio Grande, 7 seen just after hurricane of early Aug., 1933, M. B. Finley; Laguna Atascosa Nat. Wildlife Refuge, 1 seen, Oct. 21, 1965, K. S. Hansen, G. A. Unland, et al.); Aransas-Nueces cos. (island in Aransas Bay, 1 seen, ca. Dec. 1, 1890, H. P. Attwater; on flats of Harbor Island, 3 seen, Jan. 15, 1937, Earl Hunt and C. H. Jennings); Aransas-Calhoun cos. (near Carroll Island, 1 seen, July 27, 1943, Connie Hagar, et al.).]

Swans, Geese, and Ducks: Anatidae

WHISTLING SWAN, *Olor columbianus* (Ord)

SPECIES ACCOUNT

Often put in the genus *Cygnus*. An extremely large waterfowl—bigger and longer necked than any goose; generally holds neck straight (not curved as does Mute Swan); call is mellow, high-pitched cooing. *Adult*: plumage all white; black bill and legs; at close range usually shows yellow spot on bare lores. *Immature*: pale ashy gray with blackish-tipped pinkish bill; blackish legs. Length, 51½ in.; wingspan, 6¾ ft.; weight, 16 lbs.

RANGE: From Alaska Peninsula, w. and n. Alaska, and n. Mackenzie to Banks and Victoria islands, n. Keewatin, Southampton Island, s.w. Baffin Island, and extreme n. Quebec. Winters chiefly from Washington to s. California, in the Great Basin region, and from Chesapeake Bay to North Carolina; rarely to extreme n. Baja California, Texas, Louisiana, and Florida.

TEXAS: (See map.) *Winter*: Sept. to Apr. (extremes: Aug., May 3). Locally scarce to rare—formerly (prior to 1900) common to uncommon—virtually throughout. One summer record of a lingering or injured bird in Dallas Co. (fide Hazel Nichols).

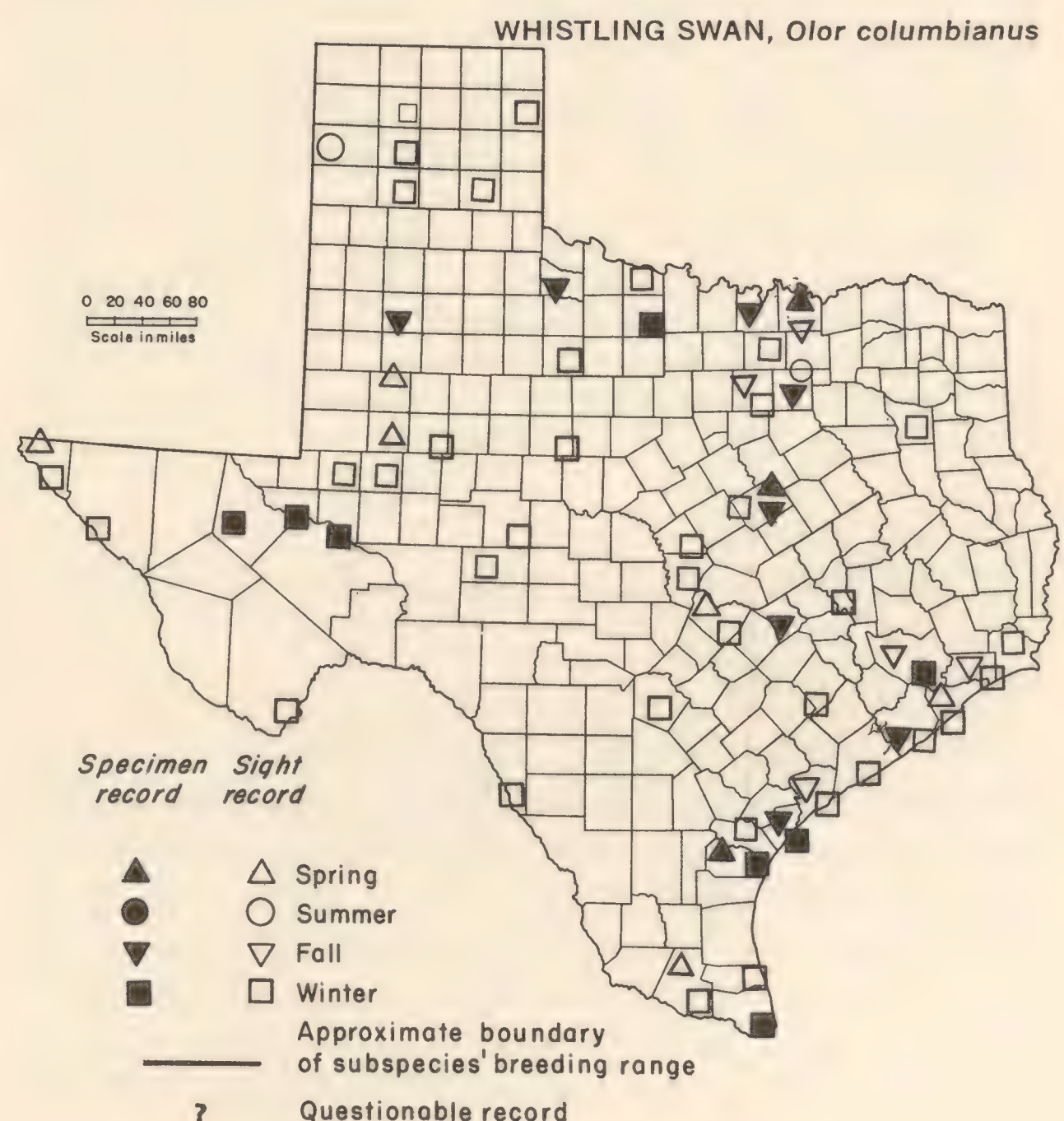
HAUNTS AND HABITS: The Whistling Swan is the first member of Anatidae, the diverse cosmopolitan family of waterfowl whose 145 members are grouped into several subfamilies according to anatomy and behavior. The larger species are contained in the Cygninae (swans) and Anserinae (geese).

Olor columbianus is the common native North American swan. (The species often seen on park ponds is the Mute Swan, of Old World origin.) The relative abundance of the Whistler in the midst of the twentieth century is due largely to the fact that it breeds on remote barrens almost entirely north of the Arctic Circle. Here, nest heaps of grass, moss, and dead leaves are constructed at pond-edge or on isles in small lakes. Swans mate for life and offspring spend the first year with their parents. Whistler migrations are practically nonstop journeys to seacoasts, chiefly the Pacific and Atlantic. The few inland rest stops which the birds make are generally on the same large bodies of water year after year. Nowadays, native American swans are seldom seen in Texas.

Although their powerful regular wing-strokes are

slow, swans apparently fly faster than geese and ducks. Migrants, often at great heights, pass in small V-shaped flocks. Shorter flights about feeding grounds are in irregular lines or bunches. The Whistler is usually airborne after a taxi of fifteen to twenty feet along the water's surface—a shorter takeoff than that required by the heavier Trumpeter. On the water, swans sit lightly and swim rapidly. Ordinarily, our two native species hold their necks in a vertical or near-vertical pose, while the Mute Swan carries its neck with a pronounced curve.

In shallows, the Whistling Swan submerges its head and long neck to pluck bottom plants; sometimes, when making a long stretch, it tips up puddle duck fashion. Chief food is roots of succulent water plants; on winter grounds, wildcelery (*Vallisneria*), foxtail (*Setaria*), and eelgrass (*Zostera*) are especially favored. As swans forage, their probing and loosening of bottom soil apparently stimulates growth of next year's aquatic plants. A feeding party generally posts a guard or relies on alarms from wary Canada Geese which often associate with the swans.



The mellow cry of the Whistling Swan—not at all a whistle—consists of three high-pitched *whoop*'s, the middle *whoop* slightly longer and louder. Swans are usually silent on water.

CHANGES: Eskimos, as well as somewhat more southerly tribes, have for hundreds of years used swan feathers, meat, and eggs. Even the bones have been made into tools and beads. Swans and geese were, and are, caught in quantity by primitive people, especially in late summer when the birds are molting and flightless. To this normal slaughter was added in the nineteenth century the white man and his firearms. By 1900, Whistling Swans were reduced on their Texas wintering grounds from common to scarce—going on rare. Since the turn of the century, Whistler decline appears to have been fairly well arrested, perhaps as a consequence of removal of all swans from the game bird list.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Entirely white. Bill and bare lores black, latter with round or oblong spot of orange or yellow; eyelids dull dark gray; iris deep brown; legs and feet black or dark slate color. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial*: Acquired by partial prenuptial molt and wear from first winter, which it resembles except for paler coloration. *First winter*: Acquired by wear from juvenal, with which it is practically identical. *Juvenal*: Acquired by complete postnatal molt. Top and sides of head dark smoke gray, somewhat mixed with paler gray; upper hindneck smoke gray; lower hindneck, back, tail, scapulars, inner secondaries, and ends of primaries dull drab gray or light drab gray, feathers more or less tipped and mixed with white; remainder of plumage white; wings in places slightly shaded with pale drab gray. Bill reddish flesh color, brownish at tip; iris hazel; feet dull yellowish flesh color or gray.

MEASUREMENTS: *Adult male*: Wing, 527.0–584.2 (average, 555.8) mm.; tail, 174.0–197.1 (184.7); bill (exposed culmen), 95.0–107.4 (102.6); height of bill at base, 47.0–51.1 (48.8); tarsus, 105.4–119.9 (114.8); middle toe without claw, 123.0–133.1 (129.3). *Adult female*: Wing, 516.9–548.6 (532.9); tail, 167.1–199.2 (179.8); bill, 93.0–105.9 (100.8); height of bill, 42.9–50.5 (46.5); tarsus, 101.1–118.1 (106.9); middle toe, 112.0–130.0 (118.4).

TEXAS: *Winter*: Taken north to Lubbock (late Nov.), Foard (ca. Nov. 30), Archer, Cooke (Nov. 13), and Grayson (Mar. 10), east to Harris, south to Refugio, Nueces, and Cameron, west to Pecos and Reeves cos. Twelve birds at Black Gap Wildlife Management Area, Brewster Co., reportedly shot by local ranchers (Dec., 1951, W. L. Thompson).

TRUMPETER SWAN, *Olor buccinator* (Richardson)

SPECIES ACCOUNT

Often put in the genus *Cygnus*. Closely resembles Whistling Swan (each usually holds neck stiffly erect), but averages larger; best told by its low-pitched, buglelike (not high-pitched, cooing) call. *Adult*: lacks yellow loreal spot, instead sometimes has a narrow reddish streak on edge of mandible. *Immature*: very similar to young Whistling but with considerable black at both base and tip (not just on tip) of pinkish bill; dull

yellowish (not blackish) legs. Length, 58¾ in.; wingspan, 7¼ ft.; weight, 23 lbs.

RANGE: Very localized—usually on protected refuges—in s. Alaska, w. (and probably c.) British Columbia, w. Alberta (Grand Prairie area), Montana (Red Rock Lakes), and Wyoming (Yellowstone, Jackson Hole). Restocked in Washington (Turnbull), Oregon (Malheur), Nevada (Ruby Lakes), and South Dakota (La-Creek). Formerly bred from c. Alaska, n. Mackenzie, Manitoba, and James Bay, south to Nebraska, Missouri, and Indiana. In winter moves to unfrozen waters, chiefly in s.e. Alaska and British Columbia; formerly occurred south to s. California and Gulf states, in Mississippi Valley, and on Atlantic coast to North Carolina.

TEXAS: *Winter* (extirpated): Formerly—prior to about 1900—locally fairly common to rare in eastern two-thirds. Last record: Galveston Co., High Island (1 shot, Feb. 15, 1927, F. C. Clarkson).

HAUNTS AND HABITS: The Trumpeter Swan, largest of wild waterfowl, tolerates little disturbance of its haunts. The more southerly breeder of the two native North American swans, *Olor buccinator* was in the swathe of westward settlement. Not only was much of its breeding area rendered uninhabitable, but also the birds were easy targets for sport hunters and plume collectors. Near extinction at the turn of the century, the Trumpeter has recovered considerably, but only in a few suitable remnants of habitat which have limited carrying capacity for these big birds.

Trumpeter cob (male) and pen (female) pair off generally at about three years of age but do not mate until five years; probably they form lifetime bonds. For nesting they seek remote shallow ponds and marshy sloughs, at least half a mile from other swan nests. The pen incubates the eggs on a large platform of plant debris, often five feet across, built on a muskrat or beaver lodge or small islet in a pond; the cob closely guards the territory about the nest. Trumpeter migration is merely a withdrawal from ice-bound areas. Canadian birds usually move south to the Pacific coast and the interior of British Columbia. Even in days gone by, when the species wintered to the Mississippi Valley and Gulf coast, the Trumpeter was not common in Texas.

Sometimes the Trumpeter flies low over water but usually it moves with firm, regular wing-beats at a considerable altitude. (The Whistling Swan tends to fly somewhat higher, especially on its longer migrations.) When taking off, *O. buccinator* patters with its huge webbed feet a good distance—sometimes one hundred feet or more—along the water's surface; airborne, it flies with neck and legs stretched out full length, though the legs do not extend beyond the tail. It sits buoyantly on water, swimming rapidly when necessary. If alarmed, it sinks a bit lower. The neck is held vertically, with head and bill horizontal. This heavy-bodied bird moves with little dexterity on land. Swans feed like puddle ducks by tipping up for leaves, roots, and seeds of aquatic vegetation. Wildcelery (*Val-*

lisneria) is a favored plant; grains, grasses, insects, snails, and small vertebrates are consumed also. Like other dabblers, the swan inadvertently swallows poisonous lead shot.

On the wing, the Trumpeter sounds a short far-carrying, sonorous *beep*. One more convolution of its windpipe accounts for a call deeper and more resonant than that of the Whistling Swan.

CHANGES: The magnificent Trumpeter Swan is no longer a Texas citizen except in a few favored zoological gardens, such as the San Antonio Zoo. During the nineteenth century, human settlement on most of its breeding grounds and wanton slaughter for "sport," meat, and feathers brought the species very close to extinction. Hudson's Bay Company alone sold some 17,000 skins of Whistling and Trumpeter swans between 1853 and 1877. *Olor buccinator* reached its nadir about 1933 when 60 individuals were believed to constitute the entire world population. Then, a previously overlooked breeding group was discovered in Alaska and another flock in Canada. In 1966 there were about 700 in contiguous United States and 1,500 north of the U.S.-Canada border. Even though the Trumpeter has increased, its extirpated-in-Texas status is likely to remain. Never great migrants, southern groups of *O. buccinator* have become almost completely resident. Closest wild Trumpeters to Texas are those in Wyoming's Yellowstone region. Here geysers and hot springs prevent ponds from freezing and U.S. Fish and Wildlife Service personnel hand out approximately one thousand bushels of grain each winter. There is no need to migrate.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Plumage entirely white. Bill black, outer edges of mandible flesh color; inside of mouth flesh color; iris brown; naked lores, with legs and feet, black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Similar to first winter but lighter in color. *First winter:* Acquired by wear from juvenal, with which it is practically identical. *Juvenal:* Acquired by complete postnatal molt. Pileum hair brown, slightly mixed with grayish white feathers and many other feathers tipped with grayish white; hindneck drab to mouse gray mixed with grayish white feathers and many feathers tipped with grayish or brownish white; back and scapulars drab gray; lower back and rump white, either slightly washed with drab gray, mostly on tips of feathers, or terminal portion of feathers mostly drab gray; upper tail-coverts drab gray; outer webs of tail feathers drab gray, inner webs pale drab gray to light mouse gray; wings dull white or brownish white, primaries tipped more or less broadly with drab to between light drab and light mouse gray or mouse gray, long subterminal portion of feathers very narrowly streaked or mottled with light drab to light mouse gray to between light mouse gray and light drab, bases of feathers usually plain white; most tertials, tips of primary coverts, and most secondary coverts drab gray to drab, somewhat mixed with brownish white; sides of head between drab and light mouse gray, some feathers with brownish white or grayish white tips; chin dull white washed with drab gray; foreneck like hindneck but somewhat lighter and also mixed with whitish feathers; remainder of lower parts dull white; lining of wing dull white, many feathers tipped with drab gray. Bill black, but middle part of culmen light flesh color with a large light purple patch on each

side, edge of mandible, together with tongue, dull yellowish flesh color; lower eyelid white; iris dark brown; legs and feet dull yellowish brown tinged with olive, but webs of toes blackish brown; claws brownish black.

MEASUREMENTS: *Adult male:* Wing, 577.1–704.8 (average, 610.1) mm.; tail, 179.1–233.9 (197.1); bill (exposed culmen), 88.9–127.0 (109.0); height of bill at base, 46.0–53.1 (49.5); tarsus, 120.9–134.1 (124.2); middle toe without claw, 134.1–165.1 (145.8). *Adult female:* Wing, 533.4–585.0 (556.8); tail, 183.1–207.0 (195.1); bill, 94.0–101.1 (97.6); height of bill, (41.4); tarsus, 101.6–127.0 (117.1); middle toe, 129.0–140.0 (135.1).

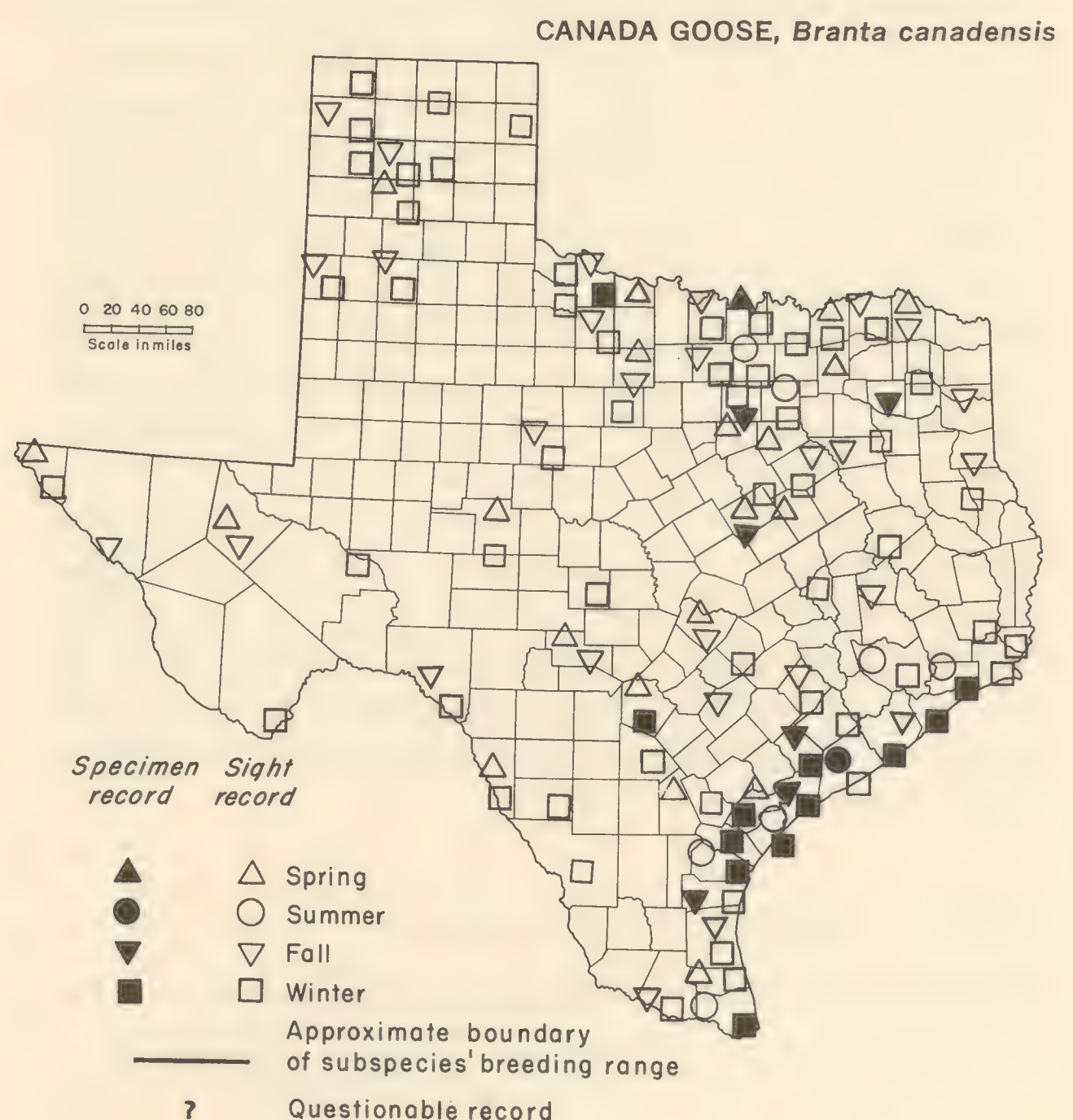
TEXAS: *Winter* (extirpated): Specimens (preserved?): Clay Co., Red River (ca. Feb. 21, and Jan. 18, 1880, A. Hall); Navarro Co., Rice (winter 1879–80, J. D. Ogilby); Bexar Co., San Antonio (several, 1884–1891, H. P. Attwater); Galveston Co., High Island (Feb. 15, 1927, F. C. Clarkson); Aransas Co., vicinity of Rockport (ca. 1890, and ca. Nov. 28, 1890, H. P. Attwater); Nueces Co., Corpus Christi (ca. 1890, H. P. Attwater).

CANADA GOOSE, *Branta canadensis* (Linnaeus)

SPECIES ACCOUNT

A small to large goose, varying greatly in size between races. Black head and neck with conspicuous white cheek patches which meet on throat to form "chin-strap"; generally grayish brown above, barred with lighter shade; variable shades of grayish brown to almost white below; white upper tail-coverts and crissum; black tail. Length, 26–48 in.; wingspan, 4½–7 ft.; weight, 5¾–24 lbs.

RANGE: N. coast of Alaska and s. arctic islands of Canada, south to n.e. California, Utah, Colorado, Minnesota, Wisconsin, Michigan, Gulf of St. Lawrence region, and Newfoundland; formerly widespread on Great Plains (reintroduced in several parts) and in e.



United States south to North Carolina. Winters chiefly from s. British Columbia, Wyoming, s. Wisconsin, s. Ontario, and Nova Scotia to n. and c. eastern Mexico, U.S. Gulf states, and Florida. Naturalized in Iceland, Scotland, England, and New Zealand.

TEXAS: (See map.) *Winter*: Late Sept. to late Mar.—some into May (extremes: Sept. 9, May 9). Locally abundant to fairly common along coast; common to uncommon in interior eastern half (west to about 98th meridian) and in northern and middle Panhandle; uncommon to rare in remainder of state. Although most individuals encountered inland are migrants, Canada is most likely goose species to winter in interior. A few specimens and numerous sightings in summer along the coast.

HAUNTS AND HABITS: This is the most widely distributed and well known wild goose in North America. Its widespread occurrence in arctic and temperate climates and habitats has resulted in modifications of behavior and even body size to fit the circumstances; it is, in fact, the most plastic large North American bird species. Nesting grounds for *B. canadensis* vary from seashore and tundra to woodland and prairie—as long as water is present. The nest, often a bulky mound of sticks and grasses, is usually built near a bank, or on an island, of a river, lake, or pond, although sometimes the goose utilizes a cliff ledge or old nest of another bird. The male does not take part in incubation, but stands guard over the nesting area. It is characteristic of the Canada Goose to stay in family groups from the time eggs hatch until the next breeding season, although these groups join others to form flocks during migration and winter. Once mated, usually at the age of two or three years, the pair remains together until one or the other dies, after which remating may take place.

In spring and fall migration, the wild musical honks of Canadas are a thrilling sound as a flock moves in V-formation across the sky. Flight is swift with measured wing-strokes; usual cruising speed is around 30 m.p.h., but hard-pressed birds can do 60. These geese generally spend the night in groups on open water but fly out to surrounding lands to feed during the day. They are essentially grazing birds, feeding on fresh leaves of newly sprouted grass or cultivated grain. In winter they feed on waste grain and also grub in mud under water for tubers of marsh plants.

Larger forms of *Branta canadensis* sound resonant honking *ka-ronk's* or *ka-lunk's* (second syllable higher and drawn-out); smaller forms, such as the Lesser Canada Goose, utter a higher pitched, faster *lo-ank, lo-ank, a-lank, a-lank*. These characteristic calls have caused the Canada to be known, especially to hunters, as the "honker."

DETAILED ACCOUNT: FOUR SUBSPECIES

INTERIOR CANADA GOOSE, *Branta canadensis major* (Rae)

B. c. interior of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from

winter plumage. Head and neck glossy black; broad white patch on each side of head, meeting across throat; back, scapulars, upper wing-coverts and sides dark olive brown edged with buffy brown or light buffy brown; rump somewhat blackish; upper tail-coverts white; tail fuscous black, outer portion of feathers fuscous; primaries and outer secondaries fuscous black, basally fuscous; inner secondaries and tertials like back; middle of abdomen and crissum white, remainder of lower parts posteriorly black; breast drab, drab gray, or light hair brown, feathers edged with paler brown or dull white; lining of wing hair brown, the outer edge drab. Bill black; iris vandyke brown or dark hazel; legs and feet slate black or black with greenish hue; male has outline of culmen more convex than female. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but colors somewhat darker and richer; edgings of feathers rather narrower. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults but duller, the head and neck somewhat more brownish, but still very similar. *First winter*: Acquired by wear from juvenal plumage, with which it is practically identical. *Juvenal*: Acquired by complete postnatal molt. Similar to adult in winter, but head and neck fuscous or fuscous black, cheeks tinged with brown; light edgings of upper parts darker, and feathers of sides and flanks less distinctly light edged. Bill black, but mandible dark drab; iris sepia; legs smoke gray; toes seal brown; claws lavender gray to drab.

MEASUREMENTS: *Adult male*: Wing, 420.1–450.1 (average, 437.6) mm.; tail, 146.0–175.0 (157.2); bill (exposed culmen), 49.0–50.0 (49.8); height of bill at base, 22.1–31.0 (27.4); tarsus, 82.0–87.9 (85.1); middle toe without claw, 74.8–92.5 (83.3). *Adult female*: Wing, 405.1–454.9 (427.5); tail, 127.0–151.1 (144.3); bill, 47.0–51.1 (49.5); height of bill, 22.1–27.9 (25.1); tarsus, 80.0–85.1 (82.8); middle toe, 71.1–80.0 (75.2).

RANGE: N.e. Manitoba along Hudson and James bays to s. Baffin Island, south to Minnesota and Michigan; formerly to North Carolina. Winters from s. Minnesota and New Jersey to s. Texas and n. Florida.

TEXAS: *Winter*: Taken northeast to Harris (Apr. 2) and Chambers (taken by hunter), south to Jackson, Refugio, Aransas, and Kleberg (Nov. 15) cos. Common.

WESTERN CANADA GOOSE, *Branta canadensis moffitti* Aldrich

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. c. major* but larger and decidedly lighter in color both above and below.

MEASUREMENTS: *Adult male*: Wing, 460.0–500.1 (average, 483.4) mm.; tail, 144.0–156.9 (150.4); bill (exposed culmen), 53.1–56.9 (55.1); height of bill at base, 24.9–27.4 (25.9); tarsus, 96.0–99.1 (97.3); middle toe without claw, 84.1–87.6 (85.9). *Adult female*: Wing, 435.1–475.0 (454.9); tail, (144.0); bill, 48.0–54.1 (50.8); height of bill, 23.1–25.9 (24.9); tarsus, 81.0–89.9 (86.9); middle toe, (70.1).

RANGE: C. British Columbia to c. Saskatchewan, south to n.e. California, n. Utah, and n. Colorado. Winters from s. British Columbia and s.e. North Dakota to n. Mexico, s. Texas, and s.e. Louisiana.

TEXAS: *Winter*: Two specimens: Jackson Co., Lavaca Forks (Feb. 20, 1885, D. H. Talbot); Aransas Co., Copano Bay (Dec. 20, 1966, W. A. Low). Although there is little evidence based on critically identified specimens or recovery of banded birds, on geographical grounds it is probable that this is the more numerous of the large forms of the Canada Goose in the western and northern parts of the state. Identification of specimens indicates that the overlap of *moffitti* and *major* is so great in the eastern and southern parts of the state that sight records of large birds cannot be placed as to subspecies.

LESSER CANADA GOOSE, *Branta canadensis parvipes* (Cassin)

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. c. moffitti* but smaller; also to *B. c. major* but smaller and paler.

MEASUREMENTS: *Adult male*: Wing, 413.0–442.0 (average, 430.3) mm.; tail, 113.0–145.0 (132.8); bill (exposed culmen), 38.5–46.0 (42.5); tarsus, 74.0–88.0 (81.5); middle toe without claw, 63.5–73.0 (68.0). *Adult female*: Wing, 410.0–423.0 (416.5); tail, 123.0–135.0 (129.0); bill, 36.0–45.5 (41.0); tarsus, 73.0–82.0; middle toe, 57.5–67.0 (62.3).

RANGE: C. Alaska inland across n. Canada, south to s. Yukon, s. Mackenzie, n.w. Manitoba, and Southampton and Baffin islands where it apparently overlaps the range of *B. hutchinsii*. Winters from Nevada and middle Atlantic coast to w. New Mexico, Texas, Veracruz, and s.w. Georgia.

TEXAS: *Winter*: Seven specimens: Chambers Co., High Island (adult male, Dec. 11, 1916, A. P. Smith); San Patricio Co., San Patricio (adult female, Dec. 20, 1885, R. Foucher); Kleberg Co., near Kingsville (5 taken, Nov. 1 and 2, 1957, C. Cottam). Recoveries of banded birds indicate that substantial numbers of *parvipes* winter in the vicinity of the Waggoner Ranch (Wilbarger Co.) and Buffalo Lake (Randall Co.). Small Canada Geese are widely distributed over the state in winter, but because it is impossible to distinguish *parvipes* from *taverneri* (see below) in the field it is not possible to know the relative distribution and status of the two subspecies without critical examination of specimens.

TAVERNER'S CANADA GOOSE, *Branta canadensis taverneri* Delacour

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. c. parvipes* but somewhat smaller and darker.

MEASUREMENTS: *Adult male*: Wing, 389.1–427.0 (average, 409.7) mm.; tail, 119.9–140.0 (129.5); bill (exposed culmen), 37.1–48.0 (40.6); height of bill at base, 20.1–24.9 (21.9); tarsus, 67.3–74.4 (70.4); middle toe without claw, 70.6–72.9 (71.7). *Adult female*: Wing, 369.1–405.1 (392.7); tail, 114.0–128.0 (122.2); bill, 34.5–46.0 (38.4); height of bill, 19.3–22.1 (20.9); tarsus, 65.5–76.5 (68.8); middle toe, 64.0–78.0 (69.3).

RANGE: W. and n. Alaska (excluding Aleutian Islands) eastward in a narrow belt across n. Canada (north of range of *parvipes*) to n.w. Keewatin. Apparently overlaps range of *B. hutchinsii minima* in Yukon Delta. Winters from s. British Columbia and n. Illinois to California, n. Mexico, and n.w. Florida.

TEXAS: *Winter*: Three specimens: Aransas Co., near Copano Bay (1 on Jan. 1, 1967, J. Powell); Kleberg Co., near Kingsville (2 males, Nov. 1 and 2, 1957, C. Cottam).

RICHARDSON'S GOOSE, *Branta hutchinsii* (Richardson)

SPECIES ACCOUNT

Treated as two races of the Canada Goose by A.O.U. check-list, 1957 (see Appendix A). A very small goose, similar in color pattern to *Branta canadensis*, but smaller with relatively shorter neck; higher, more stubby appearing bill. Length, 23–24½ in.; wingspan, 4–4½ ft.; weight, 2¾–4¾ lbs.

RANGE: Tundra of n. Alaska and Canada. Winters chiefly in Pacific states, s. United States, and n. Mexico.

TEXAS: (See map; only specimen records plotted.) *Winter*: Mid-Oct. to late Mar. Apparently uncommon to scarce along coast; migrants sighted elsewhere in state, especially in eastern half. Status difficult to determine because most sight records merged with those of Canada Goose.

HAUNTS AND HABITS: There is a distinct advantage in regarding the Richardson's Goose as a subspecies of

the Canada, as is done in most contemporary bird books: It allows the impressive statement that both the smallest and the largest wild geese are found within the *Branta canadensis* fold. Whether merged or not, however, the Canada-Richardson forms—and also the Sandhill Cranes—constitute notable reversals to Bergmann's Rule, which states that a warm-blooded vertebrate has large-bodied relatives in cold climates and small-bodied kin in warm latitudes. With *Branta*, the smallest form, *B. (canadensis) hutchinsii*, nests in the High Arctic, and the huge *B. canadensis maxima* was (it is largely extirpated) resident in such relatively torrid places as Kansas and Arkansas.

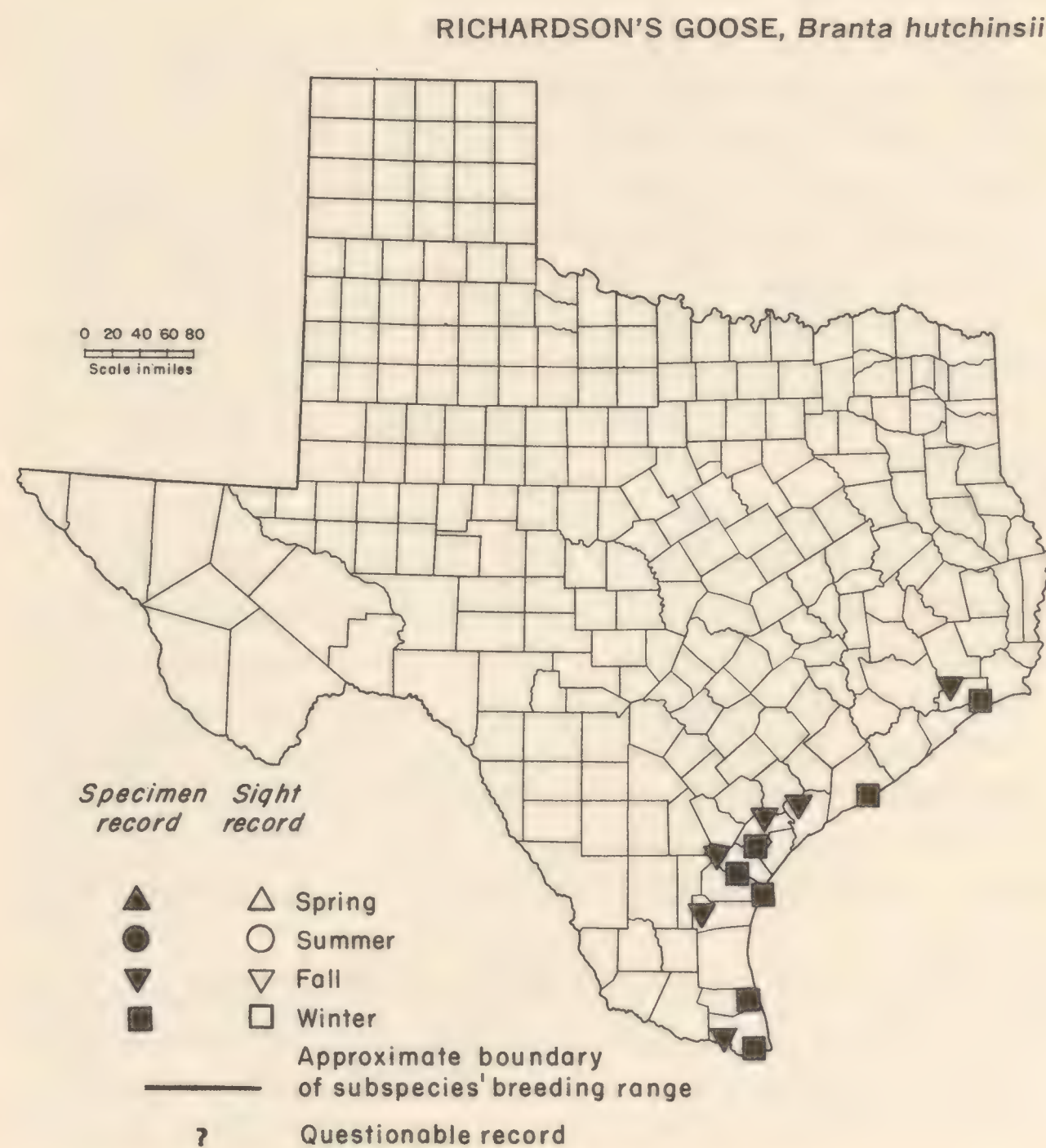
During the nesting season in its far northern breeding grounds, the Richardson's Goose is restricted to low coastal tundra where it usually places its nest on small islets in ponds; the Canada Goose generally nests more inland on higher ground. Also the nest of *B. hutchinsii* is a broad depression in the surface of open tundra made with a little dry grass and moss and lined with down; that of the Canada has more nesting material, forming a mound above the surface of the ground. In migration and winter, the Richardson's displays habits similar to those of its larger relative.

Vocalizations of this diminutive goose are a very high-pitched honking and a cackle (hence the common name of the Alaskan race—Cackling Richardson's Goose).

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN RICHARDSON'S GOOSE, *Branta hutchinsii hutchinsii* (Richardson)

Branta canadensis hutchinsii of A.O.U. check-list, 1957 (see Appendix A).



DESCRIPTION: *Adults, nuptial plumage:* Similar to the Lesser Canada Goose, *B. c. parvipes*, but smaller.

MEASUREMENTS: *Adult male:* Wing, 359.9–407.9 (average, 385.0) mm.; tail, 112.0–129.0 (118.9); bill (exposed culmen), 32.5–39.4 (35.8); height of bill at base, 18.5–21.1 (19.6); tarsus, 68.1–78.0 (72.4); middle toe without claw, 59.9–71.9 (66.8). *Adult female:* Wing, 352.1–385.0 (367.8); tail, 111.0–118.1 (113.8); bill, 31.5–36.3 (33.8); height of bill, 17.5–20.1 (19.3); tarsus, 66.0–71.9 (69.3); middle toe, 61.0–68.1 (64.0).

RANGE: Tundra shores of s. Victoria Island, Queen Maud Gulf, Melville and Boothia peninsulas, Southampton and Baffin islands. Migrates chiefly through middle Canada and United States, but occasionally to both Pacific and Atlantic states. Winters chiefly in s. Texas and n. Mexico, occasionally north to Massachusetts and south to Jalisco.

TEXAS: *Winter:* Taken northeast to Chambers, southwest to Matagorda, Refugio, Kleberg (Nov. 2 and 14), and Cameron cos. Apparently uncommon.

ACKLING RICHARDSON'S GOOSE, *Branta hutchinsii minima* Ridgway

Branta canadensis minima of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. h. hutchinsii* but slightly smaller; coloration decidedly darker above and below.

MEASUREMENTS: *Adult male:* Wing, 353.0–373.0 (average, 364.0) mm.; bill (exposed culmen), 26.0–29.0 (27.0); tarsus, 64.0–71.0 (67.0). *Adult female:* Wing, 332.0–371.0 (354.0); bill, 26.0–29.0 (27.0); tarsus, 64.0–71.0 (67.0).

RANGE: Tundra coasts of Bering Sea from vicinity of Wainwright, Alaska, to Nushagak Bay. Winters chiefly in interior valleys of Pacific states. Casual in n. Baja California, Nevada, Wisconsin, s. Texas, Hawaii, and Japan.

TEXAS: *Winter:* One specimen: Kleberg Co., King Ranch near Kingsville (female, Nov. 2, 1957, C. Cottam).

BRANT, *Branta bernicla* (Linnaeus)

SPECIES ACCOUNT

Brent Goose of Old World authors. A small goose with short neck and almost no tail. Black head, neck, chest, and upper back; wisp of white feathers on each side of neck; brownish black back; pale grayish sides and belly; white crissum; black bill and legs. Length, 24 in.; wingspan, 3¾ ft.; weight, 3½ lbs.

RANGE: Arctic coasts of e. North America to Eurasia. Winters chiefly coastally south to Baja California, North Carolina, North Sea region, w. Europe, and Japan.

TEXAS: (See map.) *Winter:* Extremely rare (14 definite records) and seasonally irregular, but usually in winter. Reported from northern Panhandle (Deaf Smith and Randall cos.), in northeastern portion near Red River (Grayson and Lamar cos.), and along coast (Jefferson, Chambers, Galveston, Wharton, Refugio, Aransas, Nueces, Cameron, and Hidalgo cos.). A record of Brant (specimens?) from Wilbarger Co., Vernon (2 shot, winter 1956–57, I. D. Acord) is probably of this species.

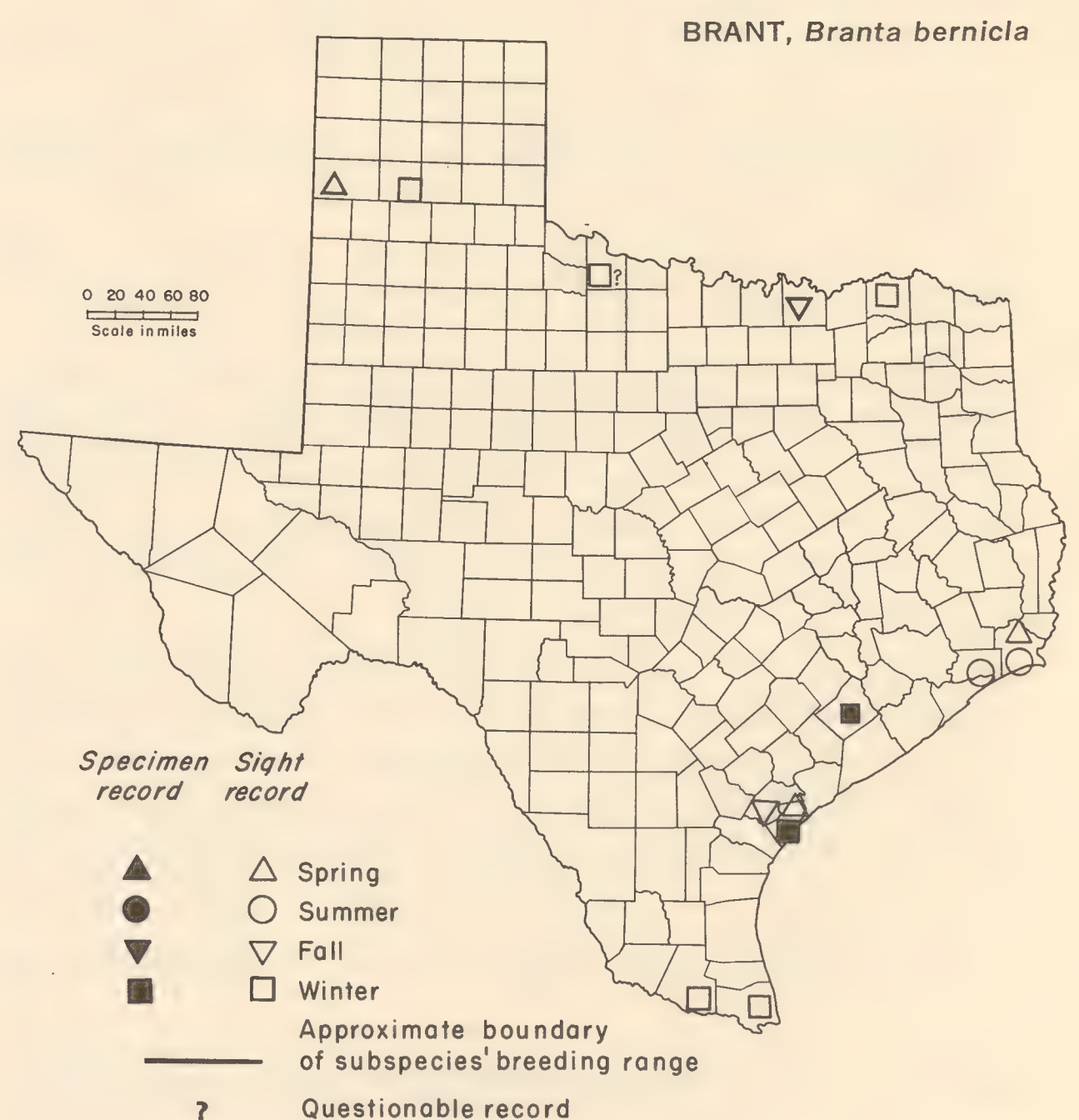
HAUNTS AND HABITS: The Brant is distinctly a sea goose. North American breeding grounds are on far arctic islets and coasts north of Hudson Bay. Nesting, at times in loose colonies, is on low sedgy flats or shin-

gle banks. If on the former, nests are usually sturdy mounds of grasses, sedges, lichens, and mosses; on shingle banks, they are less substantial, down-lined hollows amid stones. As with most geese, the female (goose) incubates the eggs, while the male (gander) stands guard a few feet away.

In fall, migrant brants move rapidly from their breeding grounds to the Cape Cod region. From there they disperse along the Atlantic coast at a slow pace. In spring, the first warm southwest winds invite their leisurely return to the Far North. This northern maritime species, averse to crossing land, is known only as a highly irregular visitor, chiefly in winter, to Texas.

Swift on the wing, brants move in long wavering lines of various character; seldom do they pass in V-shaped flocks so typical of Canada Geese. Wing-beats are short and rapid. Flight, even overland, is never at particularly great heights; ten to thirty yards is standard. Coastwise, flocks stream in compact groups quite low over the water. *Branta bernicla*, with minute tail cocked, swims lightly and with gull-like grace.

As tide goes out, it feeds in shallows, tipping up like a pond duck for its favored eelgrass (*Zostera*). As a rule, it pulls up the whole plant, eats the roots and lower stems, and discards the fronds; this floating debris is eaten later when returning tide makes dabbling impossible. On the breeding grounds, brants also eat tundra grasses, leaves of plants, and algae, such as sealettuce (*Ulva*). Beginning in the 1930's, an epidemic which killed much eelgrass severely reduced this brant's numbers. Some individuals subsisted largely on *Ulva* and marsh grasses, and with a reappearance of *Zostera*, the species has apparently recovered. This goose seldom grazes on land; it does, however, walk easily on the ground and often moves to sandy points and sandbars to rest.



The chief vocalization of the Brant is a rolling, guttural call which sounds variously like *car-r-rup* or *r-r-r-rouk* or *r-r-rup*; individuals also sound a double-noted *to-rock* and, when alarmed, a loud *wauk*. Members of a large flock, either calling in flight or gabbling as they feed, make an incredible din.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN BRANT, *Branta bernicla hrota* (Müller)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Head and neck all around black, small patch of white streaks or spots on each side of neck; back between hair brown and fuscous with lighter edgings; rump and very short tail chaetura black; longer upper tail-coverts white; primaries black, bases fuscous; secondaries and tertials dull black or chaetura black, secondaries narrowly tipped with white; inner greater coverts darker and more brownish; greater and median series and some lesser coverts tipped with white or buffy white; chin chaetura drab; throat and jugulum chaetura black; sides and flanks hair brown, feathers broadly edged with white or pale grayish; lower abdomen and crissum white; remainder of under parts drab gray or light hair brown, feathers margined with whitish; lining of wing mouse gray. Bill black; iris dark brown or black; legs, feet, and claws black or greenish black; upper sides of toes tinged with olive green. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Same as adults in winter. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but coloration somewhat lighter; white patches on sides of head less fully developed; many of greater, median, and primary wing-coverts, and secondaries with white tips. Maxilla slate black; rest of bill black; legs and feet clove brown. *First winter:* Acquired by wear from juvenal, with which it is practically identical. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but black areas duller and more brownish (less blackish); white patches on neck and sides of head absent; scapulars and wing-coverts more broadly edged with whitish or buff; lower parts paler, flanks and sides without conspicuous white tips; tail somewhat tipped with white and sometimes with white on inner webs of middle pair of rectrices. Bill, legs, and feet black.

MEASUREMENTS: *Adult male:* Wing, 294.1–336.0 (average, 317.8) mm.; tail, 86.1–104.9 (95.8); bill (exposed culmen), 31.5–36.1 (33.8); height of bill at base, 16.0–19.0 (17.5); tarsus, 55.1–66.0 (61.7); middle toe without claw, 48.0–53.1 (49.8). *Adult female:* Wing, 295.9–338.1 (318.8); tail, 83.1–102.1 (93.7); bill, 29.9–35.1 (32.3); height of bill, 16.5–19.6 (17.8); tarsus, 56.9–65.0 (60.2); middle toe, 43.2–55.1 (49.5).

RANGE: Prince Patrick and Melville islands, south to King William Island, Boothia and Melville peninsulas, and Southampton Island, thence northeast to Ellesmere, n. Greenland, Spitsbergen, and Franz Josef Land. Winters chiefly coastally, mainly from Massachusetts to North Carolina, and from Iceland and North Sea region to w. Europe, to a lesser extent from s. British Columbia to California; occurs very rarely inland in scattered localities in North America.

TEXAS: *Winter:* Records: Aransas Co., Rockport (1 taken prior to 1910, mounted by A. Sorenson; identified by W. L. McAtee); one shot in Wharton Co., Wharton (Dec. 5, 1966, tail feathers submitted to U.S. Fish and Wildlife Service, fide Ted Van Velsen).

BLACK BRANT, *Branta nigricans* (Lawrence)

SPECIES ACCOUNT

Considered conspecific with the Brant by many writers, especially in the Old World where referred to as the Pacific Brent Goose. Closely resembles the

Brant, but is darker due to extensively blackish (not pale grayish) breast and belly with blackish barring on sides; white wisps on sides of neck meet on throat to form partial neck-collar (not disjunct patches). Length, 23¾ in.; wingspan, 3¾ ft.; weight, 3 lbs.

RANGE: Arctic coasts and islands from Khatanga River delta in Siberia east to n. Alaska, n.e. Mackenzie, and adjacent islands to the north; also probably n.e. Hudson Bay (however, race here near extinction). Winters chiefly coastally, mainly from s. Kamchatka to Japan and n. China, and from s. British Columbia to Baja California; also inland on large lakes in Oregon, California, and Nevada.

TEXAS: *Winter:* Four definite records: Wilbarger Co., 15 mi. south of Vernon (1 collected, Dec. 28, 1956, J. C. Henderson; identification checked by J. W. Aldrich); Knox Co. (1 seen, Dec. 15, 1968, J. C. Henderson); Tom Green Co., near San Angelo (1 collected, 1884, W. Lloyd); Cameron Co., ca. 15 mi. east of Brownsville (1 studied at close range, Nov. 18, 1936, E. R. Ford).

HAUNTS AND HABITS: West of about the 110th meridian in the North American Arctic, the Black Brant replaces the Brant. Where their ranges touch, these two closely related geese sometimes hybridize, and numerous ornithologists are of the opinion that the dusky-bellied, western-ranging *B. nigricans* is conspecific with *B. bernicla*. On its northern haunts, the Black nests in moss and grass about tundra lakes, where it scoops its hollow in sand or turf; this beautiful neat cup, thickly lined with rich brown down from the goose, is seldom littered with tundra debris as are the nests of many other arctic-breeding species. Like *B. bernicla*, the Black is exceedingly maritime. Practically all migrants passing to and from the Pacific coast winter quarters fly through the Bering Strait; only a few cut inland across Alaska.

On the wing, brants are distinguished from other geese by their distinctive flight—undulating lines, tightly grouped and flying low across the water with quick, chopping wing-beats. The favored forage food of *B. nigricans* is eelgrass (*Zostera*), which it gleans puddle duck fashion in shallow bays. While feeding on vegetable matter, it picks up a few small mollusks, crustaceans, and other marine animals.

Black Brant vocalizations include a low harsh *gr-r-r-r-r*, *gr-r-r-r-r* and a mellow croaking *cronk*, *cronk*, *cronk*, both of which are sounded on the wing or at rest. It also utters a guttural *wah-ook*.

DETAILED ACCOUNT: ONE SUBSPECIES

PACIFIC BLACK BRANT, *Branta nigricans orientalis* Tougarinov

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Head, neck all around, and jugulum chaetura drab to chaetura black; white collar on middle of throat, but absent on hindneck; above this a zone of white markings on tips of feathers; remainder of upper parts, including

wing-coverts, fuscous, but rump and shorter upper tail-coverts more nearly chaetura drab; longest upper tail-coverts white; very short tail chaetura black to fuscous; primaries and secondaries fuscous black to fuscous; breast and abdomen hair brown to chaetura drab, gradually merging into black of neck; crissum white; sides and flanks broadly barred with white. Bill black; iris dark brown or blue-black; legs and feet black. *Adults, winter*: Acquired by complete postnuptial molt. Coloration darker than in nuptial; upper parts more uniform; lower surface also with less well defined demarcation between color of jugulum and that of body. *Second winter*: Acquired by complete postnuptial molt. Like adult winter. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but feathers of back, scapulars, and posterior lower parts smaller, those of greater and median coverts, secondaries, and rectrices narrower; upper parts lighter and more brownish; wings more brownish, lesser and median wing-coverts edged with brownish white or buff, greater coverts and secondaries margined with white or buffy white; lower surface and upper parts often with more contrast between neck and body; white collar on foreneck less well developed; flanks less heavily barred. *First winter*: Acquired by partial postjuvinal molt. Very similar to first nuptial. *Juvenal*: Acquired by complete postnatal molt. Similar to first nuptial, but head and neck above and below lighter and duller, with little or no indication of white collar; white or buff edges of wing-coverts and secondaries broader; feathers of back and scapulars more or less broadly tipped with dull buff or drab; sides and flanks almost uniform, possessing no, or very scarcely indicated, white bars.

MEASUREMENTS: *Adult male*: Wing, 316.0–343.9 (average, 328.9) mm.; tail, 85.6–99.1 (94.0); bill (exposed culmen), 31.0–37.1 (34.5); height of bill at base, 18.5–21.4 (19.8); tarsus, 56.4–67.1 (62.0); middle toe without claw, 49.0–55.1 (51.6). *Adult female*: Wing, 290.1–329.9 (304.8); tail, 84.1–100.1 (91.2); bill, 29.9–34.0 (31.8); height of bill, 16.0–19.0 (17.3); tarsus, 53.6–62.5 (62.0); middle toe, 46.0–52.1 (48.8).

RANGE: Tundra of n.w. Siberia (west to Khatanga River delta), New Siberian and Wrangel islands, n. Alaska, n.e. Mackenzie, s. Prince Patrick, s. Melville, Banks, and Victoria islands. Winters on coasts of Japan and China (though now rare), and in North America, chiefly from Vancouver Island and s. British Columbia to Baja California.

TEXAS: *Winter*: Two specimens (see species account).

[BARNACLE GOOSE, *Branta leucopsis* (Bechstein)]

Formerly believed to hatch from barnacles! A distinctly black, white, and gray goose. *Adult*: white forehead, face, chin, and throat; small black mark from eye to bill; black crown, neck, chest, upper back (becoming black-barred gray posteriorly), and tail; whitish on remaining under parts with slightly blackish-barred flanks; black bill (this small and short) and legs. *Immature*: white of face dusky-tinged; has rufous tipping on mantle; stronger barring on flanks. Length, 25 in.; wingspan, 4¼ ft.; weight, 4 lbs.

RANGE: E. Greenland, Spitsbergen, and Novaya Zemlya. Winters in n.w. Europe to British Isles, n. France, and Baltic states; a few in n.e. North America.

TEXAS: *Hypothetical*: Three careful sightings, perhaps of birds escaped or released from captivity: Cameron Co., Laguna Atascosa Nat. Wildlife Refuge (1 seen, Nov. 30, 1968, Annette Koon, Kay McCracken, Doris McGuire, and Margaret Millar; 1 seen, late Nov., 1969, M. C. LeFever, W. A. Shifflett, G. A. Unland; these separate sightings may involve the same individual); eastern Chambers Co. (1 seen with Snow and

Blue geese, Mar. 14, 1971, Mr. and Mrs. G. B. Harding).]

[RED-BREASTED GOOSE, *Branta ruficollis* (Pallas)]

An Old World goose with striking harlequinlike plumage. *Adult*: black crown, area around eye, chin, and hindneck; white round patch at base of bill; chestnut on ear region (outlined in white), on foreneck, chest, and upper breast; a narrow white border separates chestnut area from black upper parts, lower breast, and belly; broad white side-stripe; white crissum; blackish bill (this tiny and short) and legs. *Immature*: duller, browner; patch at base of bill less distinct. Length, 21–22 in.

RANGE: Coastal tundra of Siberia. Winters chiefly in Caspian Sea region, a few in Hungary. Apparently no authentic North American record of a wild bird.

TEXAS: *Hypothetical*: Two sightings, very probably of birds escaped or released from captivity: Kenedy Co., north of Raymondville (1 seen with Canadas and Snows, Dec. 23, 1969, W. H. Gooch, J. L. McDougald, J. S. Smith, and D. L. Powell); southern Colorado Co. (1 seen with Canadas, Feb. 17 and 26, 1970, Mrs. Paul Prevett).]

WHITE-FRONTED GOOSE, *Anser albifrons* (Scopoli)

SPECIES ACCOUNT

Widely known as Specklebelly. A medium-sized goose. *Adult*: brownish gray with white band on face at base of bill (hence "white-fronted"); black-blotched whitish or grayish breast and belly (especially noticeable in flight); white-tipped pinkish bill (most races); orangish legs. *Immature*: similar to adult, but lacks white face-band and black blotching on under parts; has yellowish bill and legs. Length, 28¼ in.; wingspan, 4¾ ft.; weight, 5½ lbs.

RANGE: N. Holarctic, chiefly in tundra, although absent from e. Greenland, Spitsbergen, Iceland, and n. Scandinavia. Winters south to France, n. Africa, Greece, Iraq, Afghanistan, China, Japan, s. Mexico, and U.S. Gulf coast.

TEXAS: (See map.) *Winter*: Late Sept. to late Mar.—a few to late Apr. (extremes: Aug. 16, May 3). Locally common (formerly sometimes abundant) to uncommon along coast; scarce and highly irregular inland within eastern half west to about 98th meridian; ordinarily rare to absent in remainder of state. Most birds in interior are migrants.

HAUNTS AND HABITS: The holarctic White-fronted Goose breeds in North America from Alaska to Greenland but is rarely seen in the United States east of the Mississippi Flyway. Summer haunts are shallow lakes, marshes, and slow-flowing rivers of low coastal tundra; to a lesser degree it breeds in scrub tundra and on the

northern fringes of the forested zone. Whitefronts, often in extensive colonies, scoop out nests or place them in natural hollows on low hillocks or islets in pools; these they line with coarse grasses, lichens, down, or dead leaves of dwarf willow. The five or six cream-colored eggs of this early nester are usually being incubated by the first of June. These geese gather in large flocks before heading south to their standard winter homes on the Pacific and Gulf of Mexico coasts.

Flight is strong, swift, and generally high. From a distance, V-shaped flocks of Whitefronts resemble those of the Canada Goose, but as the birds approach, their black-splotted bellies and laughing cries help identify them. Transients drop into grain fields to feed—in fall on waste seed; in spring on tender sprouting shoots. They also stop to graze on grass in meadows, and to pick up beechnuts and acorns about woodland pond margins. First arrivals on the breeding grounds feed on dried crowberries from the previous season, but as summer progresses, the tundra yields grasses, sedges, and other plants, plus ripening fruits of wild berries. Whitefronts eat a few aquatic larvae and insects as well. On winter estuaries and mud flats, they feed on marsh grasses and probe in bottom mud for roots of aquatic plants.

A distinctive call of the White-fronted Goose, sounded in flight, is a high-pitched, tootling *kah-lah-aluck*; a laughing *wah-wah-wah* is also uttered.

CHANGES: All geese, with the possible exception of the Blue and Ross', have declined in Texas, but the Whitefront has gone down more than the others. According to Christmas Bird Counts published in *Audubon Field Notes* (now *American Birds*), during the 1940's and 1950's the abundance rank of regular geese

along the Texas coast was: first, Snow Goose; second, Canada; third, Whitefront; and fourth, Blue Goose. Since 1960, *Anser albifrons* has, in most years, ranked at the bottom of this list. Causes of the Whitefront's steeper decline are not obvious.

DETAILED ACCOUNT: TWO SUBSPECIES [PLUS ONE HYPOTHETICAL]

AMERICAN WHITE-FRONTED GOOSE, *Anser albifrons frontalis* Baird

Pacific White-fronted Goose of J. Delacour. Most ornithologists regard *frontalis* as the common wintering race in Texas (see *A. a. gambelli* below).

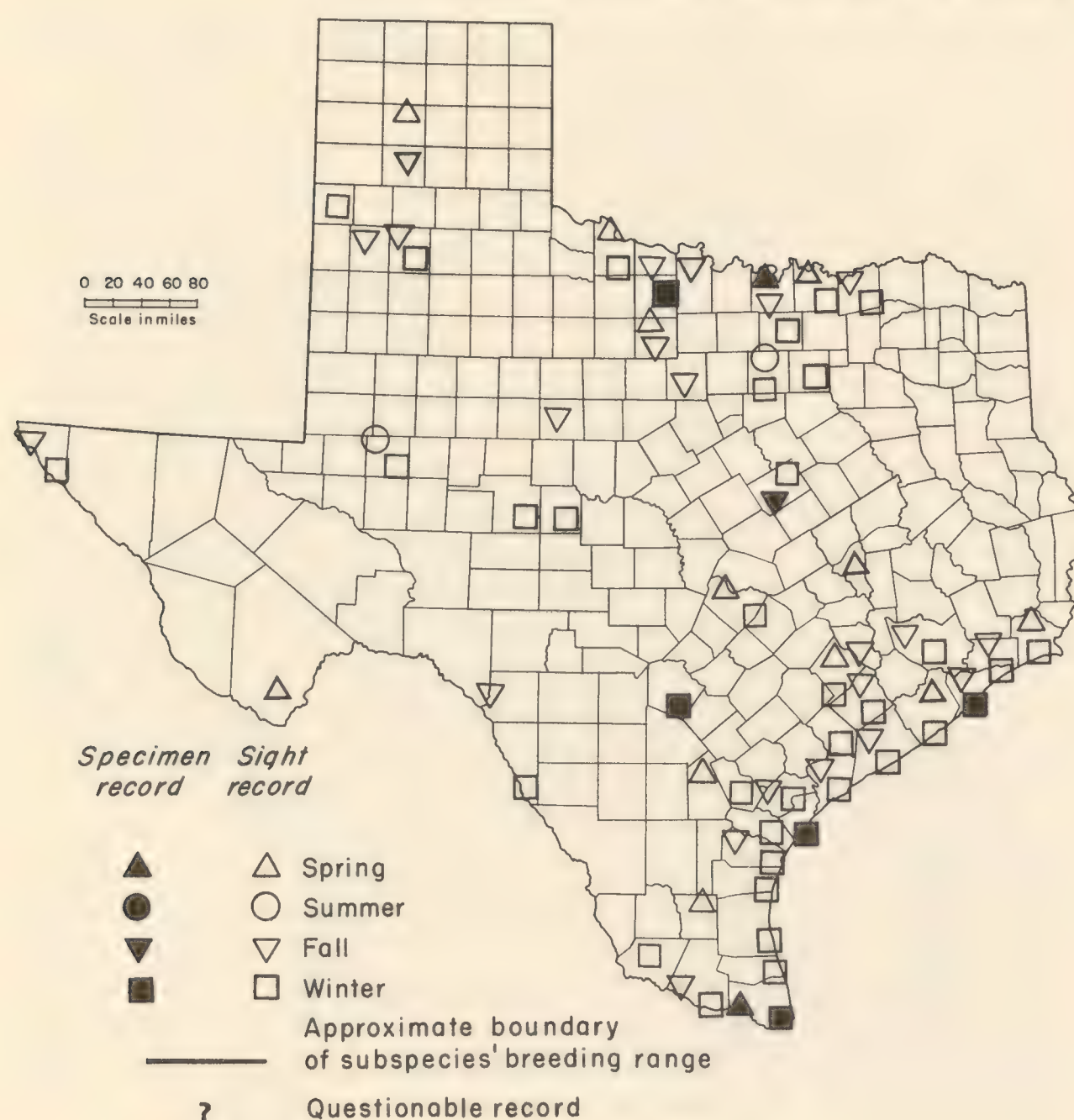
DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Forehead and anterior part of lores white, bordered narrowly behind by dull black; crown, hindneck, and mantle dull olive brown, rather more grayish on mantle; all feathers more or less broadly edged with buffy brown or very pale buff; rump chaetura drab, upper tail-coverts white; tail fuscous, basal portion of shafts yellowish white; secondaries and ends of primaries chaetura black, bases of outer primaries, lining of wing, and outer wing-coverts mouse gray, inner wing-coverts like back, greater series with broad tips of buffy white, shafts of primaries yellowish white; throat, sides of head and of neck dull wood brown; sides and flanks wood brown or dull buffy brown with light buff or whitish bars formed by tips of feathers; thighs light drab mixed with white; remainder of under parts white; breast and abdomen heavily blotched with chaetura black or fuscous black; bases of feathers light drab or drab gray; lower abdomen and crissum immaculate. Bill pale flesh color, cadmium yellow, light buff, or white, but nail white or cream color; corner of mouth and bare skin on chin cadmium yellow; bare skin about eye dark grayish brown, sometimes yellow; legs and feet orange, cadmium yellow, or ochraceous salmon, but webs of toes paler, sometimes reddish flesh color; claws dull white. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but feathers of upper parts more conspicuously edged with buff or pale brown. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults but with less black on under surface. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial, but feathers of upper surface with broader light edgings. *First nuptial:* Acquired by partial prenuptial molt. Similar to first winter, but with some white on forehead, and usually some black spots on lower parts. *First winter:* Acquired by wear from juvenal, with which it is practically identical. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but black and white of forehead and lores absent; upper parts duller, edgings of feathers darker and less conspicuous; median lower parts plain white without black spots or blotches; sides of body lighter than in adult. Bill yellowish gray, dull flesh color, or dull orange buff, nail pale smoke gray or dull black tipped with white; iris raw umber; legs and feet dull yellow or orange-yellow; claws army brown, benzo brown, pallid vinaceous drab, or deep brownish black.

MEASUREMENTS: *Adult male:* Wing, 384.0–431.0 (average, 412.5) mm.; tail, 106.9–135.1 (121.4); bill (exposed culmen), 42.9–52.1 (48.0); height of bill at base, 21.6–25.9 (23.4); tarsus, 70.1–79.0 (73.2); middle toe without claw, 61.0–75.9 (70.6). *Adult female:* Wing, 384.0–420.1 (404.1); tail, 113.0–126.0 (119.6); bill, 42.9–51.1 (46.0); height of bill, 18.0–21.6 (20.6); tarsus, 64.0–75.9 (71.1); middle toe, 57.9–77.0 (67.1).

RANGE: Arctic tundra of Alaska, n.e. Mackenzie, and n.e. Keewatin; also e. Siberia (probably west to Kolyma Valley). Winters in North America, from s. British Columbia (rarely) to Baja California, mainland Mexico, and Texas, very rarely east of Mississippi; also in China and Japan.

TEXAS: *Winter:* One specimen: El Paso Co., Frontera (ca. 1853, John Henry Clark, Emory Mexican and U.S. Boundary Survey; U.S. National Museum collection).

WHITE-FRONTED GOOSE, *Anser albifrons*



TULE WHITE-FRONTED GOOSE, *Anser albifrons gambelli*
Hartlaub

This race does not occur in Texas, according to A.O.U. checklist, 1957. Oberholser considered the breeding range of this race to be in eastern arctic Canada and the chief migration route to be through the Mississippi Valley; accordingly, he presumed *gambelli* to be the more common of the two races found in Texas.

DESCRIPTION: *Adults, nuptial plumage:* Similar to *A. a. frontalis* but darker and decidedly larger.

MEASUREMENTS: *Adult male:* Wing, 420.1–475.0 (average, 438.7) mm.; tail, 124.0–144.0 (135.9); bill (exposed culmen), 52.1–62.0 (56.4); height of bill at base, 24.9–27.9 (26.4); tarsus, 70.1–84.1 (78.7); middle toe without claw, 72.9–84.1 (79.2). *Adult female:* Wing, 407.9–443.0 (425.4); tail, 110.0–135.1 (127.3); bill, 50.0–57.9 (54.3); height of bill, 24.9–26.9 (25.7); tarsus, 71.9–83.1 (77.2); middle toe, 71.1–80.0 (75.2).

RANGE: Exact breeding range unknown, but probably arctic islands of District of Franklin. Winters chiefly on coasts of Texas and Louisiana; also in c. California (Sacramento Valley).

TEXAS: *Winter:* Taken north to Cooke (Mar. 15), east to Galveston, south to Cameron, west to Kerr (exact date unknown) cos. Several shot (specimens?) in Bexar Co., Mitchell Lake (winter 1863–64, H. E. Dresser). One found dead in Randall Co., Buffalo Lake (1955, Peggy Acord).

[GREENLAND WHITE-FRONTED GOOSE, *Anser albifrons flavirostris* Dalgety and Scott

DESCRIPTION: *Adults, nuptial plumage:* Similar to *A. a. frontalis* but decidedly darker, particularly above; has bright yellow bill.

RANGE: W. coast of Greenland. Winters in Iceland, Eire, and Scotland; casually on Atlantic coast of North America.

TEXAS: *Hypothetical:* No specimen, but one individual sighted in Galveston Co., Galveston (Oct. 10, 1960, T. B. Feltner, D. A. Deaver). The bird, which was alone in a field, was studied at close range in good light. It remained under observation for a considerable period and was readily identified by its dark coloration and conspicuously yellow bill.]

SNOW GOOSE, *Chen hyperborea* (Pallas)

SPECIES ACCOUNT

A medium-sized goose. *Adult:* all white except for black primaries (both surfaces); head often stained with rusty; white-tipped pinkish bill with black mark between mandibles ("grinning patch"); pinkish legs. *Immature:* mostly white, but more or less washed and mottled with brownish gray on head, neck, back, and sides; blackish bill; grayish legs. Length, 28 in.; wing-span, 4¾ ft.; weight, 4¾ lbs.

RANGE: Arctic coasts of n.e. Siberia (breeders rare), North America, and Greenland. Winters chiefly coastally, south to Japan (rarely), Baja California, Tamaulipas, Gulf states (to panhandle of Florida), and North Carolina.

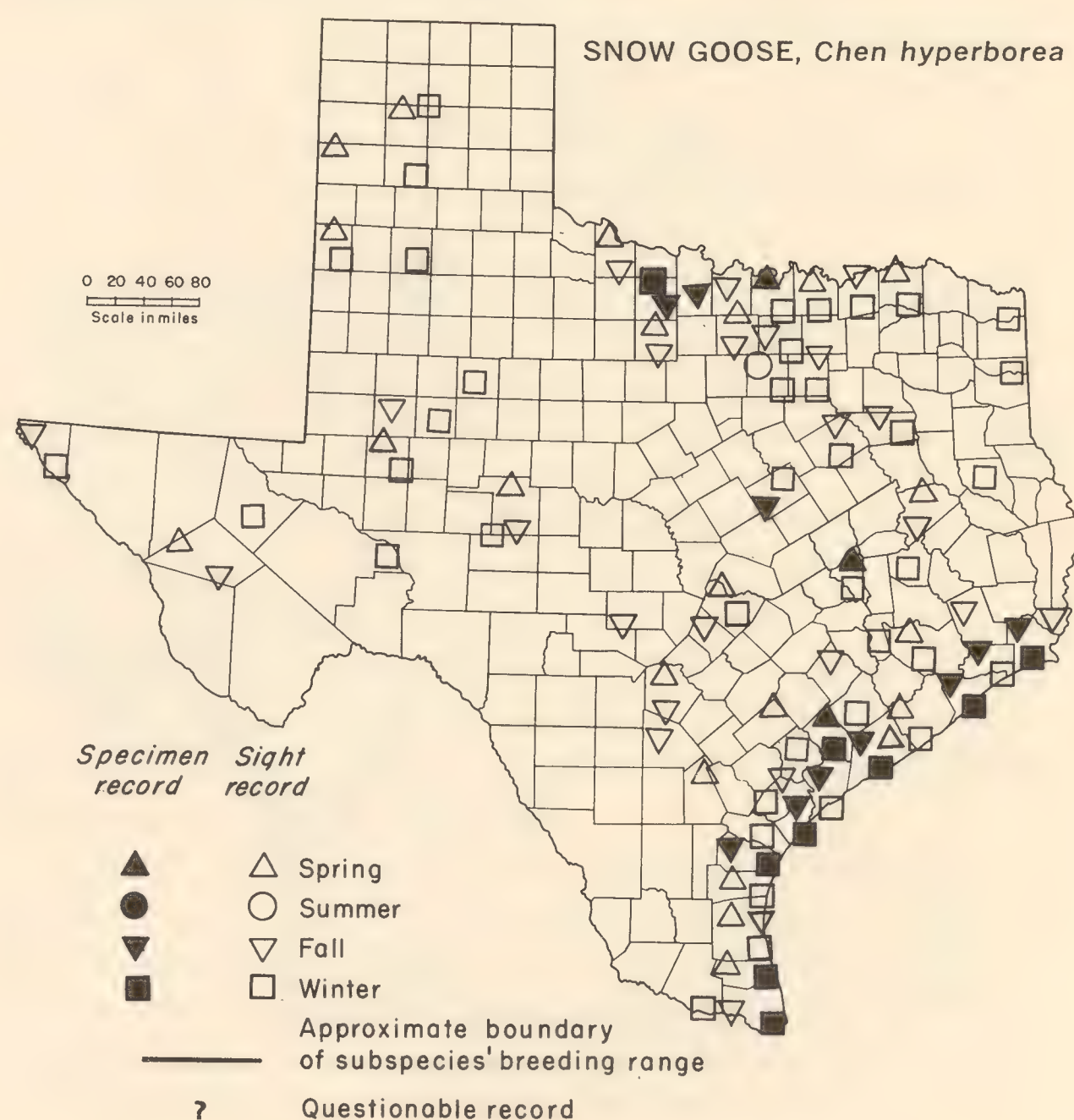
TEXAS: (See map.) *Winter:* Late Sept. to late Apr.—a few into May (extremes: Aug. 19, June 10). Locally abundant to common along coast; common (occasionally) to scarce in interior of eastern half (west to about 98th meridian) and in Panhandle; usually rare in remainder of state. Migrants much more numerous than wintering birds in inland areas. Sometimes lingers into summer on upper coast (numerous records, fide S. G. Williams).

HAUNTS AND HABITS: The snowy-feathered *Chen hyperborea*, as its scientific name translates, is indeed a "goose of the Far North." Few North American Anatidae breed so extensively across the extreme northern tundra as does the present species. In these barrens, the Snow Goose nests in flat, marshy coastal regions. On a dry spot of ground, usually at lake-edge, it constructs a sturdy grass- and down-lined cup of moss. The more common and widespread race, the Lesser Snow Goose, *C. h. hyperborea*, breeds largely west of Hudson Bay, while the Greater, *C. h. atlantica*, is restricted mainly to Greenland. Racial separation is maintained during winter as well: Lessers move to Pacific states and Gulf of Mexico coasts; Greaters fly to U.S. Atlantic bays and marshes. The autumn push of Snow Geese is a concerted, almost nonstop drive, but the return flight in spring is more leisurely.

On strong and steady wings, Snow Geese fly in loose V's or long straggling lines, often high in the air. Migrants usually fly at night; foraging birds, by day. Flocks often alight to feed in rice and other fields, meadows, and on grassy plains. Toward spring, they eat winter wheat, oats, and other growing grains and grasses; in fall, waste grain is gleaned from stubble. Snow Geese also frequently grub for roots and stems of rushes, sedges, and marsh grasses which they find on mud flats. A large compact flock of these geese can easily transform a feeding area into a mud wallow.

The shrill falsetto *whouk* or *kaahk* of the Snow Goose, when uttered by members of a passing flock, produces a clamor that is strangely musical.

CHANGES: There are few more beautiful sights than a flock of clean Snow Geese flying across a pure blue sky. Both of these purities are still widespread in Texas, but their end is in sight. In the smog-palled, oil- and carbon-blackened Houston–Texas City–Galveston area a



really white Snow Goose is nowadays hard to find, but on the Eagle Lake and Lissie prairies—"the goose-hunting capital of the world"—even more appalling degeneration has occurred. At Garwood, Colorado County, a locality within the goose metropolis, over one hundred carcasses of geese—mostly Snows, but some Blues and Whitefronts—were found during two days in the spring of 1971. Other dead and dying geese were picked up near Anahuac, Chambers County, another traditional waterfowl concentration point. Tissues of some of these corpses were examined at the Agricultural Analytical Laboratory at Texas A&M University. Results showed extremely high overkills of mercury and dieldrin, ranging from ten to forty parts per million for the latter.

Dead individuals had eaten seed rice treated with organic mercury fungicide and aldrin pesticide. Bodies of sick birds had converted aldrin into dieldrin. Individuals carrying sublethal doses of these and related chlorinated hydrocarbons tend to lay fragile eggs, are very susceptible to disease, and often engage in erratic behavior.

Prior to 1971 most Snow Geese left Texas in February for the leisurely northward migration; thus, they were gone before Gulf coast rice farmers broadcast their poisoned seeds. In 1971 an unusually high number of geese, perhaps somewhat intoxicated with residues of hydrocarbons from previous years, lingered into March and April—and were fatally poisoned.

On March 24, 1972, the U.S. Environmental Protection Agency banned the application of mercury preparations to rice seed. Perhaps this long overdue action will give waterfowl a reprieve, unless substituted chemicals prove equally poisonous.

DETAILED ACCOUNT: ONE SUBSPECIES

LESSER SNOW GOOSE, *Chen hyperborea hyperborea* (Pallas)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper and lower parts white; ends of primaries dull black; basal portion of primaries hair brown, becoming pale gray on edges of outer webs, shafts of more outer primaries yellowish white basally; outer webs of outermost secondaries chaetura drab; alula mouse gray; primary coverts light neutral gray. Bill geranium red, vinaceous, or purplish pink, nail of maxilla white, pale drab gray, or pinkish buff; space between edges of mandibles slate black; eyelids dull white; iris vandyke brown; legs and feet deep purplish pink or vinaceous; soles of toes dull yellow; claws dull brown or slate black. *Adults, winter:* Acquired by complete postnuptial molt. Same as nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by partial prenuptial molt and wear from first winter. Similar to nuptial adults, but head and wings with some markings of light gray or light brown and drab; wings as in juvenal. Legs and feet hair brown; claws drab. *First winter:* Acquired by wear from juvenal, with which it is practically identical, except somewhat paler. *Juvenal:* Acquired by complete postnatal molt. Plumage mostly white, but head, neck, and upper parts, including tail, variously mottled or washed with hair brown, light hair brown, and drab gray; secondaries all white, except broad terminal portion of outer webs, and a little dark mottling on inner part of terminal portion of outer webs; primary coverts somewhat paler and partly mottled with white. Bill purplish vinaceous buff, washed with dull black,

but nail dull white tinged with black; legs and feet drab gray; claws blackish slate.

MEASUREMENTS: *Adult male:* Wing, 395.0–460.0 (average, 430.0) mm.; tail, 115.1–165.1 (130.0); bill (exposed culmen), 49.0–62.0 (57.9); height of bill at base, 28.9–36.6 (33.3); tarsus, 78.0–90.9 (84.1); middle toe without claw, 52.1–67.1 (61.7). *Adult female:* Wing, 380.0–439.9 (420.1); tail, 115.1–165.1 (130.0); bill, 50.0–61.0 (55.9); height of bill, 27.9–38.1 (33.0); tarsus, 74.9–88.9 (82.0); middle toe, 56.9–65.0 (60.7).

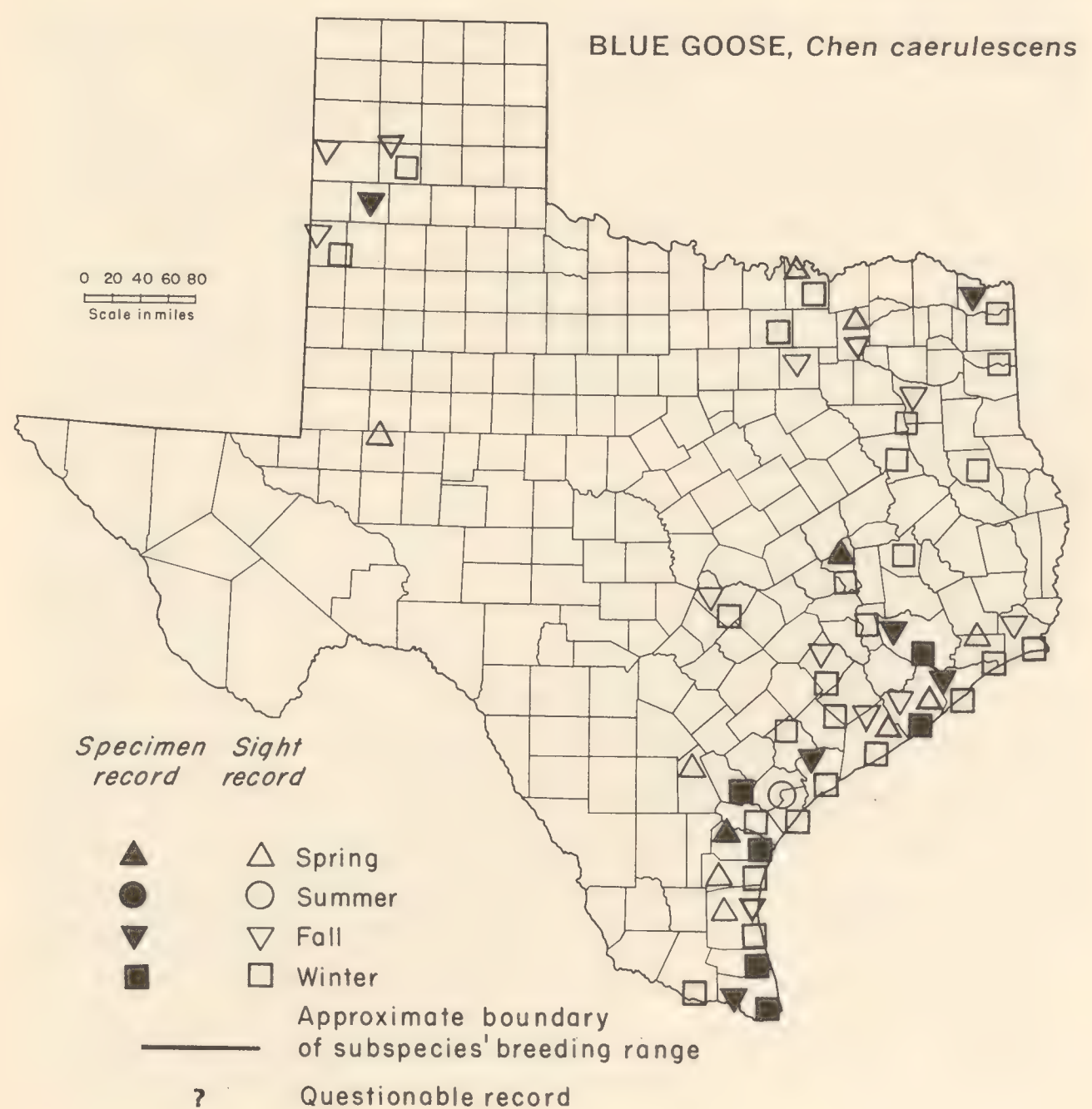
RANGE: N.e. Siberia (breeders rare), Wrangel Island, n. Alaska, n. Mackenzie, Banks, Melville, and Victoria islands, n. Keewatin, Southampton Island, and s.w. Baffin Island. Winters chiefly coastally, from British Columbia to California (also inland in Central Valley) and Baja California, and from Tamaulipas and Texas to panhandle of Florida (occasionally); locally in interior U.S. (mainly west of Mississippi) and Mexico to Jalisco and Guanajuato; rarely on Asiatic coast south to Japan; a few on U.S. Atlantic coast.

TEXAS: *Winter:* Taken north to Archer and Cooke (Mar. 17), east to Jefferson, southwest to Matagorda, Nueces, and Cameron cos.

BLUE GOOSE, *Chen caerulescens* (Linnaeus)

SPECIES ACCOUNT

Regarded by many as dark phase of *Chen hyperborea hyperborea*. A medium-sized goose. *Adult:* mainly sooty gray with white head (often rust-stained), neck, rump, and crissum; white-tipped pinkish bill with black mark between mandibles ("grinning patch"); pinkish legs. Many adults have under parts extensively or entirely white, apparently indicating interbreeding with Snow Goose. *Immature:* similar to adult, but head and neck also sooty gray. Told from young White-fronted Goose, which it closely resembles, by pinkish-tinged blackish (not yellowish) bill and legs. Length, 28½ in.; wingspan, 3½ ft.; weight, 5½ lbs.



RANGE: N. Keewatin (Queen Maud Gulf) to s. Southampton Island and s.w. Baffin Island. Winters in greatest numbers from upper Gulf coast of Texas to Mississippi Delta in Louisiana, decreasingly southward to Tamaulipas; a few on Atlantic coast, chiefly from New Jersey to Georgia, and in Tennessee Valley.

TEXAS: (See map.) *Winter*: Late Sept. to late Apr.—a few into May (extremes: Aug. 19, May 17). Very common, occasionally verging on abundant, on upper coast; common to fairly common on central coast; common to uncommon on lower coast; scarce and irregular inland in eastern half (west to about 98th meridian); rare in northern and middle Panhandle, accidental in Midland Co., Midland (Mar. 5–7, 1960, F. Newkirk, et al.). Migrants much more numerous than wintering birds in interior of state, but status difficult to determine because migration is largely nocturnal and non-stop. Sometimes lingers into summer on upper coast (several records, fide S. G. Williams).

HAUNTS AND HABITS: The status of the Blue Goose as a separate species is a much debated topic among ornithologists; many consider it merely a color phase of the Lesser Snow Goose, *Chen hyperborea hyperborea*, with which it closely associates at all times of the year. However, it is curious that the Greater Snow Goose, *C. h. atlantica*, has no “blue” phase. The proportion of dark phase individuals has gradually been increasing in recent years, although in Texas the change is not yet very apparent. As late as the Christmas season of 1970, white geese were still clearly leading in numbers. Arctic specialist G. M. Sutton has noted that with most mixed pairs of white and dark geese, it is the female which is the “blue” one; he thinks strong sex dimorphism may be evolving as has already occurred in the kelp geese, *Chloephaga*, of South America. The *Chen* genus promises to continue entertaining ornithological taxonomists.

Discovery of the breeding grounds of the Blue Goose involved a six-year search of approximately thirty thousand miles across Canada’s barren tundra; the first nesting area was discovered in 1929 by J. Dewey Soper and the Eskimo caribou hunter Kavivau. Under cold gray skies, the Blue Goose builds its nest on a relatively dry mound of earth amid muddy stagnant pools; this large and bulky structure is built of shredded moss and lined with grass and down.

In fall, Blue Geese move along the eastern shores of Hudson Bay, thence southwestward in a rapid, practically nonstop flight to their confined winter quarters along the Louisiana and Texas Gulf coast. Their spring return is considerably more leisurely; it is also longer than the fall route by about six hundred miles. This flight moves mainly up the western side of the Mississippi Valley; birds then cut east to James Bay, and from there follow the autumn course back to the breeding areas. This trip of about three thousand miles—which could be done in two weeks—usually takes northward-bound Blues about eleven weeks.

Migrants, honking as they pass, fly in irregular V’s, lines, or curves. They are also quite noisy when feed-

ing. During midday, flocks usually rest on mud flats; they forage from mid-afternoon until dark and from predawn until about 10:00 A.M. In the North, tundra grass is the mainstay. On winter territory, they graze on both roots and tops of cattails (*Typha*), *Panicum* and *Spartina* grasses, marshmillet (*Zizaniopsis milia-cea*), spikesedge (*Eleocharis*), and bulrushes (*Scirpus*). Flocks of these ravenous geese often denude their feeding plots as they grub.

The honk of the Blue Goose has been described as a high-pitched *guop*; this is often interspersed with an undertone of conversational *ga-ga-ga-ga-ga*’s. A clear high whistle is apparently the call note of young Blues. All vocalizations seem to be identical with those of the Snow Goose.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial*: Acquired by wear from winter plumage. Head and neck white; back anteriorly dark mouse gray or dark neutral gray; remainder of back and scapulars brownish hair brown or brownish deep neutral gray; rump neutral gray or light neutral gray; feathers all with paler edges; upper tail-coverts grayish white, feathers with hair brown centers; tail dark hair brown, broadly edged and tipped with grayish white or pale brownish gray; primaries and secondaries fuscous or fuscous black, latter broadly edged with dull white, basal portion of shafts of the more outer primaries yellowish white; lesser and primary coverts smoke gray; remaining upper wing-coverts neutral gray or deep neutral gray; anterior part of jugulum deep neutral gray; rest of jugulum, sides, and flanks neutral gray or hair brown; middle of abdomen and crissum similar but paler, and lower abdomen and crissum somewhat mixed with pale gray (many specimens with considerable and variable amount of white on posterior lower parts, probably indicating hybridization with Lesser Snow Goose, *C. h. hyperborea*); axillars white anteriorly, grayish white or very pale gray posteriorly; under edge of wing smoke gray or pale smoke gray; rest of lining of wing mouse gray. Bill pink, dull crimson, reddish, or pale flesh color, but nail white or dull white, open space on side of bill and cutting edges black; iris dark brown or black; legs and feet deep flesh color or deep purplish pink. *Adults, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adults. *Second nuptial*: Acquired by wear from second winter. Similar to nuptial adults, but head with a few dark markings, wings somewhat duller. *Second winter*: Acquired by complete postnuptial molt. Essentially identical with second nuptial. *First nuptial*: Acquired by partial prenuptial molt. Similar to second nuptial, but pileum and hindneck with considerable black or slate color; wings similar to those of juvenal—that is, duller and more brownish. Bill flesh color, but nail pale brown, interspace between mandibles black; iris dark brown or deep hazel; legs and feet purplish flesh color. *First winter*: Acquired by wear from juvenal, with which it is practically identical, though prenuptial molt, producing first nuptial, begins early in winter. *Juvenal*: Acquired by complete postnatal molt. Crown and hindneck hair brown or dark hair brown, hindneck darkest; upper back mouse gray; remainder of back brownish neutral gray or brownish deep neutral gray, edges of feathers most brownish; rump pallid mouse gray, centers of feathers darker; primaries and secondaries dull black, decidedly brownish, and without white basally; tertials and scapulars dull dark brown; lesser wing-coverts margined with dull brown; chin white; throat mouse gray, lighter anteriorly and darker posteriorly, like hindneck; lower jugulum dull, rather brownish drab; remainder of lower surface dull light drab or grayish drab, feathers with paler margins; lower abdomen and crissum whitish; lining of wing between light neutral gray and drab gray, feathers edged with

darker. Bill dull black, flesh color basally; legs and feet dull black.

MEASUREMENTS: *Adult male:* Wing, 386.1–415.0 (average, 402.9) mm.; tail, 112.5–129.0 (122.7); bill (exposed culmen), 52.1–58.4 (55.6); height of bill at base, 31.0–35.6 (32.8); tarsus, 78.7–88.9 (83.3); middle toe without claw, 57.9–65.0 (61.7). *Adult female:* Wing, 383.0–407.9 (394.2); tail, 111.0–120.9 (116.3); bill, 53.6–57.9 (55.6); height of bill, 29.9–33.0 (31.8); tarsus, 77.0–84.1 (80.7); middle toe, 56.9–63.5 (60.7).

TEXAS: *Winter:* Taken northeast to Bowie (Nov. 10), south to Brazos (spring), Galveston, Nueces, and Cameron cos. One captured outside normal winter range: Castro Co., near Dimmitt (autumn 1942, H. McManigal).

ROSS' GOOSE, *Exanthemops rossii* (Cassin)

SPECIES ACCOUNT

Chen rossii of A.O.U. check-list, 1957 (see Appendix A). *Adult:* closely resembles the Snow Goose, but averages slightly smaller (inferior field mark) with shorter neck; bill is smaller, shorter, lacks "grinning patch," and, at very close range, shows warty protuberances at base. *Immature:* very similar to young Snow, but washed and mottled paler grayish brown; has pinkish bill (not blackish), and legs (not grayish). Length, 23¼ in.; wingspan, 4 ft.; weight, 2¾ lbs.

RANGE: N.e. Mackenzie (Perry River), n. Keewatin (Queen Maud Gulf), and Southampton Island (Boas River). Winters chiefly in California's Sacramento, San Joaquin, and Imperial valleys; rare, but apparently regular, in scattered localities in western half of United States.

TEXAS: (See map.) *Winter:* Oct. 10 to Mar. 16. Apparently rare, chiefly in northern third and along coast; probably nowadays scarce but regular on and near upper coast (where recorded yearly since 1965), and at

El Paso (seen yearly since 1968). Difficulty of separating in field from Snow Goose makes status uncertain.

HAUNTS AND HABITS: The Ross' Goose, appearing tiny and dainty, is the rarest (only about 30,000 in 1965), least studied North American goose species. Not until 1938 were its tundra nesting grounds discovered in Canada; here, usually in loose colonies on lake isles, nests are hollowed in the ground and lined with grass and down. By early October, the Ross' is generally on its way to its very circumscribed winter grounds. The standard migration route is via Great Slave and Athabasca lakes and Montana; here it leaves Gulf-coast-bound geese and ducks and cuts across the Rocky Mountains to the Central Valley of California. Each winter in recent years, however, Audubon Christmas bird counters usually have turned up several stray Ross' Geese on the Texas coast; nine such individuals were censused in 1970. Ross' Goose population in Texas may be slowly rising, but it is more likely that increasing numbers of bird watchers scrutinize Snow Geese with greater care.

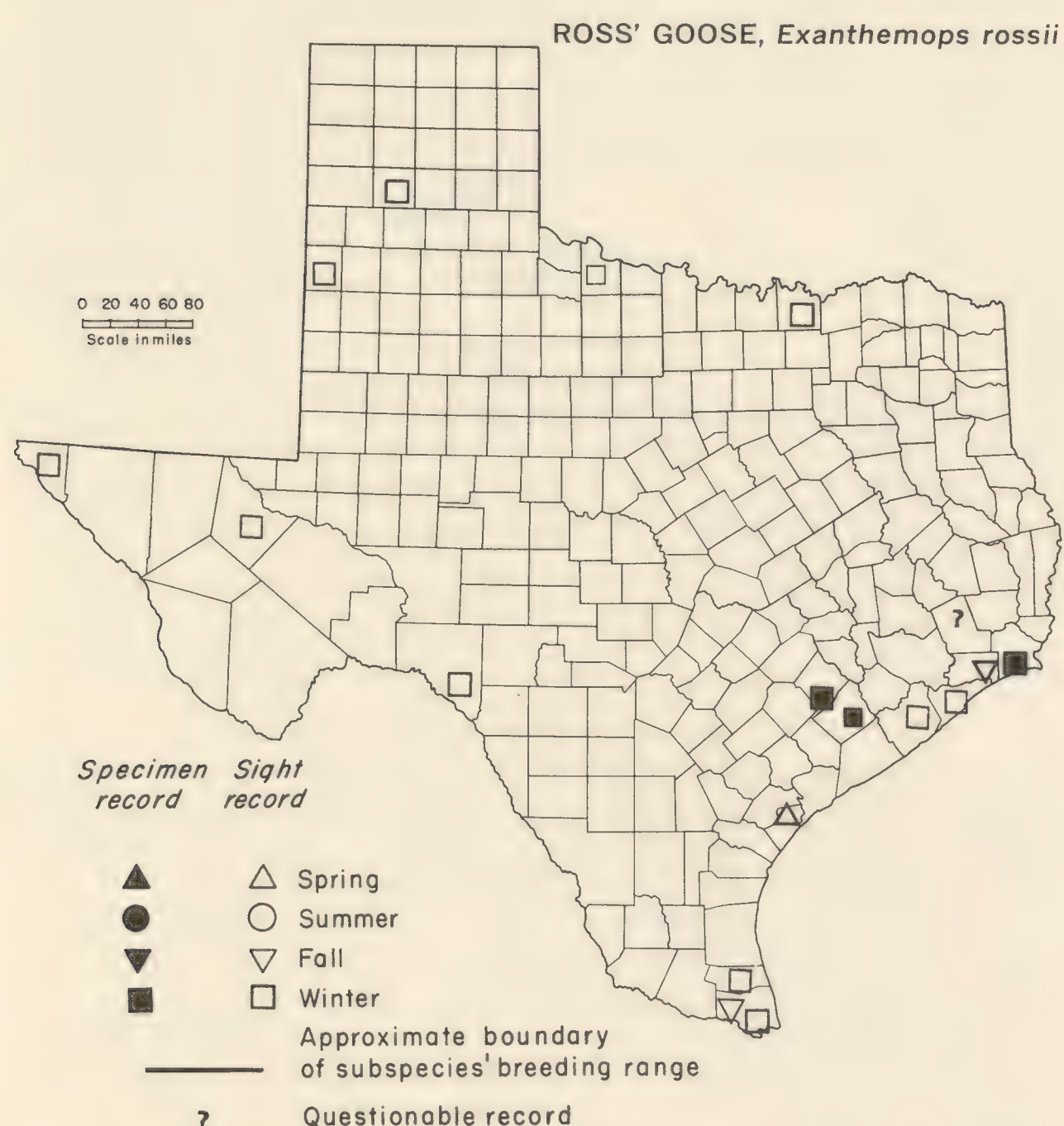
During cold months, *E. rossii* generally associates with Snow Geese, and forages with them in stubble fields for waste grain. It also grazes on young winter grasses and growing wheat and oats. In general, Ross' behavior is like that of its larger cousin, the Snow, but at times it appears somewhat tamer.

The weak calls of the Ross' Goose, decidedly different from those of other geese, include a grunting *kug* or a double-noted *kek-kek* or *ke-gak*. It seldom vocalizes on the wing.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Pure white, except primaries and primary coverts; primaries brownish black, middle portion of shafts fuscous, paling to yellowish white on basal portion, basal portion of outer edge of outermost primary, with primary coverts and alula, smoke gray to between mouse gray and smoke gray, outer webs of these coverts and alula usually broadly margined or entirely very pale gray, grayish white, or white. Bill dull reddish pink, base somewhat bluish or greenish and showing warty protuberances, nail white; feet dull reddish pink. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired by practically complete prenuptial molt. Similar to adults, but base of bill with narrow, more or less parallel lines and slightly elevated ridges, the tubercles of adult only slightly indicated—thus, whole base of bill much smoother than in adult. *First winter:* Acquired by wear from juvenal. Similar to first nuptial, but bill still smoother and without indication of tubercles, also without, or with only very slight indication of, lines; crown and region about eye, sometimes including lores, with occiput, hindneck, back, scapulars, and central tail feathers, more or less mottled or tinged with light hair brown, smoke gray, mouse gray, or light drab; tertials light hair brown to drab; primary coverts extensively white, sometimes nearly all white, mottled with smoke gray; flanks somewhat tinged with drab, drab gray, or light drab. Bill, legs, and feet more or less pinkish. *Juvenal:* Acquired by complete postnatal molt. Similar to first winter, but drab and brownish areas more deeply colored and more extensive. Bill pinkish; legs and feet greenish gray with tinge of pink.

MEASUREMENTS: *Adult male:* Wing, 348.0–381.0 (average, 368.3) mm.; tail, 106.9–129.0 (117.1); bill (exposed culmen),



36.1–43.9 (40.6); height of bill at base, 21.1–26.9 (23.6); tarsus, 65.0–74.9 (70.4); middle toe without claw, 47.5–51.1 (49.3). *Adult female*: Wing, 337.1–358.1 (349.2); tail, 104.9–119.9 (113.5); bill, 35.1–40.9 (37.8); height of bill, 21.9–23.9 (23.1); tarsus, 61.0–73.9 (64.8); middle toe, 45.0–50.5 (47.3).

TEXAS: *Winter*: Six specimens: Jefferson Co., between Hampshire and China (Dec., 1953, D. Daigle); Wharton Co., 11 mi. southeast of Eagle Lake (Jan. 4, 1954, F. Pearson); Colorado Co., 15 mi. west of Eagle Lake (female, Dec., 1966, shot by hunter; Texas A&M University collection, no. 7078); Colorado Co. (2 birds, Dec., 1964, Hudgens; mounted in Dallas Museum of Natural History); Jeff Davis Co., Whittenburg Ranch, 19 mi. north of Ft. Davis (date unknown, Joe Robinette; Sul Ross State University collection, no. 432). Reported shot: Wilbarger Co., Waggoner Ranch (winter 1956–57, fide Peggy Acord); Baylor Co. (banded bird shot, 1961, fide L. R. Wolfe); Chambers Co. (1 killed, between East and Trinity bays, Nov. 17, 1948, fide A. K. McKay; 2 killed, Dec. 3, 1948, fide S. G. Williams). One bird trapped and banded: Calhoun Co., Aransas Nat. Wildlife Refuge (date unknown, fide L. R. Wolfe).

BLACK-BELLIED TREE DUCK, *Dendrocygna autumnalis* (Linnaeus)

SPECIES ACCOUNT

Also known as Red-billed Whistling Duck. A large, long-necked, goselike duck with blue-tipped coral bill; long, flesh pink legs. Cinnamon brown crown, back, chest; grayish sides of head and neck; white wing-patch; black rump, breast, belly, sides. In flight, flashes (above) bold white stripe almost entire length of black wing; (below) black underwings continuous with belly. Length, 21¼ in.; wingspan, 3 ft.; weight, 2 lbs.

RANGE: S. Arizona (sporadic), s. Texas, and s. Florida (probable escapees breeding at Miami in 1970), south

through lowlands of Mexico and Central America to Ecuador, n. Argentina, and Brazil. Sometimes largely withdraws in winter from United States.

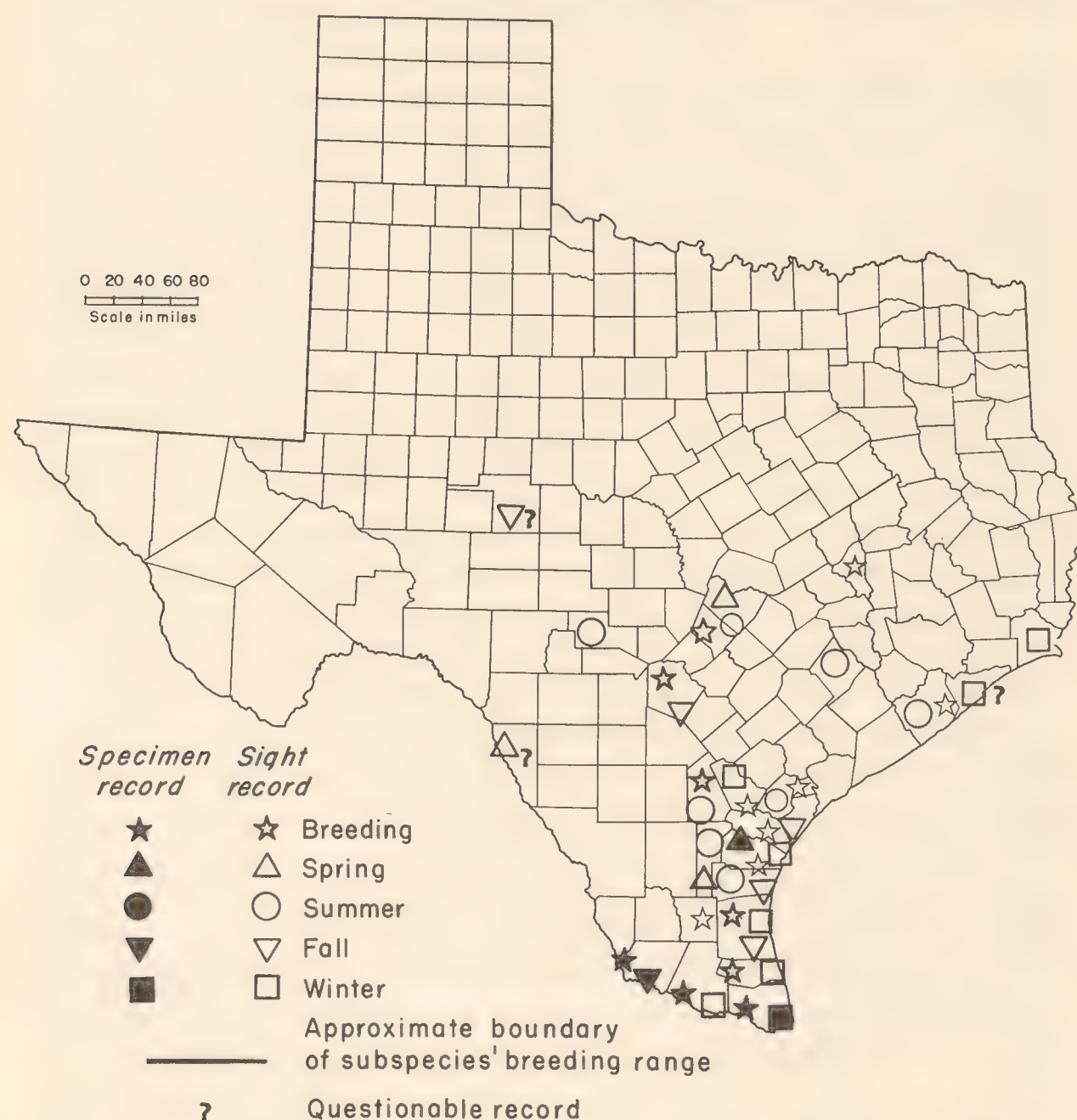
TEXAS: (See map.) *Resident* (fewer in winter): Breeds, late Apr. to Oct.—occasionally to early Nov. (eggs, May 3 to Oct. 18; downy young, July 4 to Oct. 22; half-grown young as late as Dec. 20) from near sea level to 700 ft. Very locally common to scarce in Rio Grande delta (upriver to Rio Grande City), and on coastal plain north to San Patricio Co. (especially numerous up Nueces River valley through Live Oak Co.); locally scarce to rare on coast from Sinton to Freeport. Has bred in Bexar Co., San Antonio (adult with 6 young, Oct. 19, 1958, San Antonio Audubon Society); and Hays Co., San Marcos fish hatchery (brood reported, June 5, 1968, fide Mary Anne McClendon). Recent breeding discovered in Brazos Co., 4 mi. southwest of College Station (first found, Aug. 20, 1972, R. F. Gotie; photo no. 36 in Texas Photo-Record File, Texas A&M University). Largely withdraws in winter from coast north of Sinton and from interior north of Rio Grande delta; large concentrations may occur locally (e.g., Cameron Co., Laguna Atascosa, ca. 1,000 birds, Dec., 1967, R. J. Hitch; Nueces Co., Corpus Christi, ca. 100, winter 1968–69, Kay McCracken). *Vagrant*: Has wandered irregularly to Maverick, Kerr, Tom Green, Hays (flock of 10 photographed, June 15, 1970, Mary Anne McClendon), Travis, Colorado, Jefferson, and Galveston cos.

HAUNTS AND HABITS: South Texas is the chief place north of Mexico that suffices as breeding grounds for the largely tropical Black-bellied and Fulvous tree ducks; these two species are the northernmost representatives of the curious *Dendrocygninae*, also referred to as tree swans and whistling ducks. *Dendrocygna autumnalis* seeks freshwater situations: secluded rivers, resacas, ponds, swamps, and marshes; these areas are much more often situated in wooded areas than those sought by the Fulvous.

By April, the Blackbelly returns from its Latin American winter quarters to begin a prolonged nesting season. Unlike most ducks, but like swans and geese, this tree duck forms close pair-bonds in which mates share family duties. Together, a couple scouts for and selects a cavity in a tree trunk, or sometimes a nest site on the ground. After the female is finished laying, the drake helps her with incubation of the eggs, which hatch in about twenty-eight days. The beautifully marked black and yellow downy ducklings are probably the most attractive of all waterfowl babies, according to Jean Delacour, leading connoisseur of the subject. Father and mother convoy their ducklings on both land and water. When the young are well grown in fall, most individuals of *D. autumnalis* migrate southward, but some remain near where they nested.

More goose- than duck-like, these birds fly with slow wing-beats; head, neck, and legs are extended and arch below body level. As they slowly flap along, usually just above treetops, the ducks seem like prehistoric

BLACK-BELLIED TREE DUCK, *Dendrocygna autumnalis*





Black-bellied Tree Duck, *Dendrocygna autumnalis*

creatures, pterodactyls perhaps. Migrant Blackbellies, whistling their peculiar notes, move in lines across the night sky. To land, a bird drops its legs and bends at the midsection so that the bill practically touches its toes. This land-oriented duck seldom alights on water or swims in deep places; however, it swims well and can dive, although somewhat clumsily. During the day the Blackbelly, usually standing upright, rests and preens on banks, sandbars, or on tree limbs, often in flocks. Most feeding is done after dark when birds wade about in shallows or move into fields. Corn, especially favored by the Blackbelly, is sometimes obtained as the bird perches on stalks. Other food includes grass seeds and aquatic plants.

The shrill *pe-che-che-ne*, which serves as one colloquial name for this duck, is whistled almost continuously in flight, also as the bird stands in trees or on the ground. Black-bellied Tree Ducks are easily domesticated and, because they are quite vociferous when alarmed, make efficient night watch guards.

CHANGES: Black-bellied Tree Duck numbers fluctuate markedly, but from 1946 through 1970 gains appeared to outnumber losses—a highly unusual performance for any bird in the degenerate twentieth century. From 1946 to 1959 no Black-bellied Tree Ducks were reported on U.S. Audubon Christmas Bird Counts, with the exception of 25 at Harlingen, Texas, December 26, 1949.

With the dawning of the 1960's, *Dendrocygna autumnalis* began to perk up. Six were Christmas-counted at Bentsen-Rio Grande Valley State Park in 1960. During subsequent seasons figures were as follows: 2 at Laguna Atascosa National Wildlife Refuge, 1961 (but Arizona had high count for the nation with 7); 2, Bentsen, 1962; 2, Welder Wildlife Refuge, 1964; 25, Laguna Atascosa, 1967; 64, Welder, 1968; and 36, Corpus Christi, 1970.

Upturn in the duck's numbers in the central coast region seems to have been caused by the creation of Lake Corpus Christi. With completion of Wesley Seale Dam on the boundary of Jim Wells and San Patricio counties in 1958, Nueces River bottomlands were flooded almost to George West, Live Oak County. Thousands of live oaks, mesquites, pecans, and other trees were drowned and left standing in and near shallow water. As holes in trunks became enlarged with decay, Black-bellied Tree Ducks gained new nest sites. Corn, sorghum, and oats grown on nearby ranches helped to feed them. By 1962, biologist E. G. Bolen reported a fine population of *D. autumnalis* on northern Lake Corpus Christi, especially between Peace Valley Harbor and Swinney Switch. With a large summertime population, chances are increased for more of these semi-migrant ducks to be counted during the Christmas season.

The 1960's will likely prove to be the high-water mark in the Blackbelly's Texas history. Already in the early 1970's numbers seem to be dropping a bit. As Lake Corpus Christi ages, aquatic plant food will de-

cline and nest trees will fall over and rot completely away.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BLACK-BELLIED TREE DUCK, *Dendrocygna autumnalis fulgens* Friedmann

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Forehead dull light buff; top of head russet, occiput dark mars brown; neck anteriorly tawny, shading posteriorly to brownish sienna, and on back and scapulars to chestnut; lower back chaetura drab edged with hair brown; rump, upper tail-coverts, and tail black; primaries fuscous black; most primary coverts and outer webs of several of middle primaries white; secondaries black; greater wing-coverts white; middle coverts smoke gray; lesser coverts old gold or isabella color; lining of wing fuscous black; sides of head smoke gray, ring around eye dull white; chin dull white; upper throat pale smoke gray; lower throat and breast tawny; sides and crissum black, latter tipped and streaked with white; middle of abdomen fuscous black. Bill coral red, deep pink, reddish flesh color, or dark purple, but region of nostrils orange or orange-yellow, nail pale blue-black; mandible paler, tipped with blue; eye-rim light blue; iris dark brown; legs and feet white, pinkish white, or light flesh color; claws black. *Adults, winter:* Acquired by complete post-nuptial molt. Practically identical with nuptial adults. *First nuptial:* Acquired by wear from first winter, possibly also by partial prenuptial molt. Similar to first winter. Bill pale vinaceous, nail cinereous, but tip yellowish white; iris vandyke brown; legs and feet pinkish white; claws drab. *First winter:* Acquired by wear from juvenal, with which it is practically identical. *Juvenal:* Acquired by complete postnatal molt. Crown dull cinnamon buff; hindneck cinnamon, passing into sayal brown on upper back; lower back and scapulars saccardo umber; upper tail-coverts clove brown or fuscous, with narrow terminal bars of dull pale buff; tail fuscous, margined and tipped with dull buff or buffy white; wings similar to those of adult but duller and more brownish, wing-coverts drab, and white areas duller and more buffy or brownish; lower surface pale brownish gray washed with pale buff; sides and flanks more grayish and streaked broadly with fuscous or fuscous black; crissum whitish. Bill dull brown or bluish above, yellow below; legs olive. *Natal:* Upper parts chaetura black, fuscous black to fuscous, with broad long transverse spot on each side of back, and squarish spot on each side of rump, also another farther around on side, and still another pair posterior to these—eight spots in total—all bright lemon yellow to light colonial buff; posterior edge of wing lemon yellow or ivory yellow; supraloral stripe and stripe across cheeks extending as narrower streak across occiput lemon yellow, dull cream buff, or chamois, as are malar region and sides of neck, leaving only narrow portion of hindneck dark brown; broad semicircular stripe across infra-auricular region, not extending to bill but posteriorly joining hindneck, fuscous black to fuscous; also fuscous black, or with fuscous spot, on middle of lower throat; entire lower parts bright lemon yellow; or else chin and throat deep cream buff to chamois and remaining lower parts light colonial buff to cream buff, feathers sometimes slightly tipped with fuscous, particularly on jugulum. Bill slate green; iris dark blackish brown; legs and feet blackish tinged with yellow; claws black.

MEASUREMENTS: *Adult male:* Wing, 233.9–244.1 (average, 239.8) mm.; tail, 66.0–71.1 (70.1); bill (exposed culmen), 48.0–55.1 (51.8); height of bill at base, 21.1–23.9 (22.9); tarsus, 59.4–64.0 (61.2); middle toe without claw, 64.0–71.1 (67.6). *Adult female:* Wing, 233.9–241.0 (235.7); tail, 65.0–71.1 (67.6); bill, 48.0–53.1 (50.3); height of bill, 22.1–23.1 (22.4); tarsus, 56.9–63.0 (58.9); middle toe, 62.0–70.1 (64.5).

RANGE: S. Texas, south to Nuevo León and Tamaulipas. A few records in California, Arizona, and West Indies. Winters chiefly from Sinaloa and Veracruz to Panama.

TEXAS: *Resident* (fewer in winter): Collected in Nueces, Cameron, Hidalgo, and Starr cos. *Vagrant:* See species account.

NESTING: *Nest:* In open woodlands or groves, often some distance from water; in cavity in tree trunk or large branch, eggs laid on bare wood, sometimes with scanty lining of feathers and down and chips of decayed wood; rarely on ground. *Eggs:* 10–20, usually 12–16; ovate or short ovate; smooth or very glossy; cream white, yellowish white, or pure white; unmarked but often nest stained; average size, 52.3×38.4 mm.

FULVOUS TREE DUCK, *Dendrocygna bicolor* (Vieillot)

SPECIES ACCOUNT

Also known as Fulvous Whistling Duck. A fairly large, long-necked duck with blackish bill; long blue-gray legs. Tawny brown head (darker on crown); chest, breast, and belly; blackish back with wavy bars of tawny; blackish wings (both surfaces); black rump and tail, the latter crossed by white band at base; whitish neck-collar, elongated feathers of side and flank, and crissum. Length, $20\frac{1}{4}$ in.; wingspan, $35\frac{3}{4}$; weight (1 male), ca. $1\frac{3}{4}$ lbs.

RANGE: Locally from c. California (no breeding records in Arizona or New Mexico) to s. Texas, Louisiana (at least formerly), and Florida (probable escapees breeding at Miami; in recent years flocks from other parts of range have invaded in winter), south to c. Mexico; Honduras; Colombia to Guianas; and c. Brazil to n. Argentina; also e. Africa (Sudan to Natal); Madagascar; India and Ceylon. Northern population partly migratory and inclined, especially in recent years, to erratic wandering.

TEXAS: (See map.) *Breeding:* Early May to late Oct. (eggs, May 10 to Sept. 16; downy young as late as Oct.

19) from near sea level to 170 ft.—once about 1,800 ft. Locally fairly common—formerly very common—to rare and highly irregular along coast and inland to Colorado and Brooks cos.; has bred in Gillespie Co., 18 mi. north of Kerrville (adult and 2 small young, June 22, 1950, A. Sprunt, Jr.). *Migration:* Feb. 12 to May 30; Aug. 6 to Nov. 20. Irregularly very common—formerly abundant—to uncommon along coast, especially just offshore. *Winter:* Late Nov. to late Feb. Fairly common locally (a few winters) to rare from Sinton to Brownsville; scarce—formerly occasionally common—to absent north of Sinton to Anahuac. *Vagrant:* Casual wanderer to Brewster, Tom Green (specimens), Kerr, Bexar, Travis, Brazos, and Waller cos.; accidental in El Paso (specimen), Jeff Davis, Midland, and Dallas cos.

HAUNTS AND HABITS: The Fulvous Tree Duck's extremely odd natural world range comprises several widely disjunct areas in the warm temperate regions and Tropics of both the Old and New World; probably these scattered pockets are remnants of an ancient contiguous distribution.

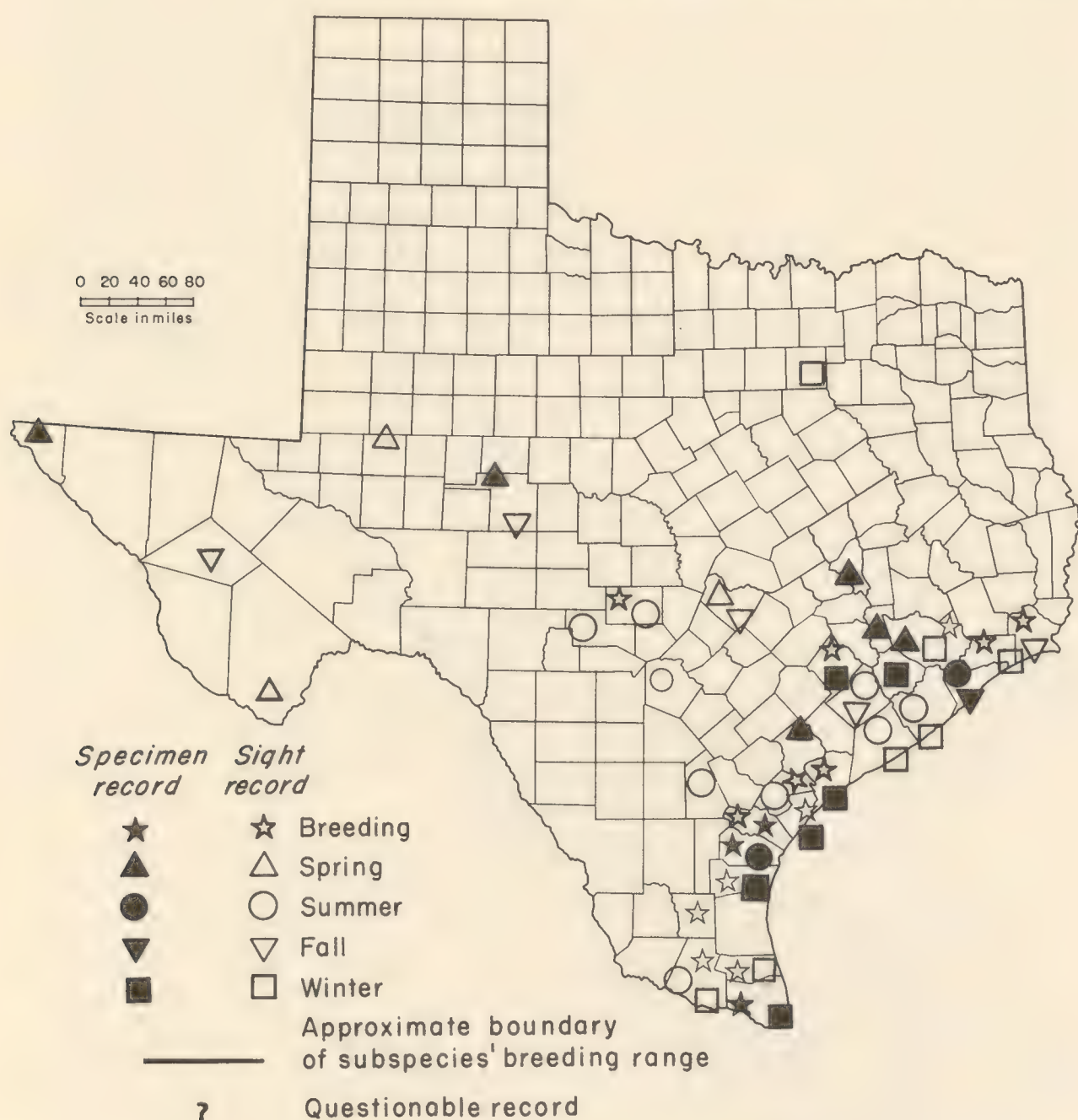
This shy duck haunts grassy freshwater marshes and ponds. Fields of rice growing in shallow water are especially favored—but nowadays are mostly lethal. The common name of this tree duck is somewhat misleading, for the species rarely perches in trees and prefers to nest on the ground; only very occasionally does it resort to a cavity in a tree. Aside from choice of nest site, reproductive behavior is similar to that of the Black-bellied Tree Duck. Early in fall, most birds retreat from the United States and move chiefly to similar freshwater situations in coastal regions of Mexico. In recent years (since late-1950's), sizable flocks of the ducks have wintered in Florida.

The Fulvous and its close relatives are very goose-like. Perched, *Dendrocygna bicolor* stands erect but perhaps not quite as upright as the Blackbelly. On the wing, it is strong, but its strokes are slow; head, neck, and long legs are extended and droop lower than the duck's body. Migrants, flying mostly by night, move in bunches rather than in lines or V-formations; the squealing whistles of these passing ducks are a familiar sound to Latin Americans in both fall and spring. The Fulvous is largely a nocturnal feeder. With its flat bill, well equipped with lamellae, it sifts through mud, mainly for germinating seeds of grasses and forbs. Flocks often move to fields to glean rice, corn, alfalfa, or other crops or to oak woods for acorns.

This duck's drawn-out flight whistle is a squealing *k-weeoo* or a windy *to-wheee*; at a distance a flock seems to emit faint *kill-dee* whistles. A group of Fulvous Tree Ducks is especially clamorous when taking wing.

CHANGES: From the early 1900's through 1958, fields of the Texas rice basket, located chiefly between the towns of Eagle Lake and Orange, teemed with bird life. Among this wealth, the most exciting to a naturalist was the Fulvous Tree Duck, the only game bird native both to Texas marshes and exotic Old World

FULVOUS TREE DUCK, *Dendrocygna bicolor*



elephant country. On August 6, 1958, J. Frank Dobie and E. B. Kincaid, Jr., witnessed over 500 Fulvous Tree Ducks slowly flapping their black wings over a rice field in Colorado County near Eagle Lake. This stirring scene closely resembled a picture made in India by the noted animal photographer Ylla.

Last big nesting year for *Dendrocygna bicolor* in the Lone Star State was 1959. In 1960, rice farmers in Texas and elsewhere began stepping up their already heavy dosages of mercury fungicides and other deadly pesticides (DDT, aldrin, dieldrin, etc.). Suppression of duck reproduction was dramatic. In 1960, decline of even adult *D. bicolor* became spectacular. From the northern (Chambers Co.) to the southern (San Patricio Co.) tip of this duck's main nesting area the veteran bird observers A. K. McKay, C. H. Aiken, and Clarence Cottam reported a greater than 90 percent reduction in individuals from those present in 1959. Heavy application of pesticides and herbicides in and near rice fields continued through the 1960's. On top of all this, U.S. Air Force and other airplanes sprayed the entire Texas coast during the summer of 1971 in an attempt to wipe out mosquitoes that might be carrying Venezuelan Equine Encephalomyelitis (VEE), a horse disease which had just then entered the United States for the first time.

Starting in 1955, appreciable numbers of Fulvous Tree Ducks had ventured beyond their normal twentieth-century range. Fortunately, this movement continued during the species' breeding collapse in the rice belt. Some ducks went to Florida, some up the Atlantic coast as far as New Brunswick, Canada; a few reached the Great Lakes.

Prior to 1955, the Fulvous was very seldom recorded on Audubon Christmas Bird Counts; however, Texas achieved a high count for the nation with 26 at Harlingen in 1947, and again in 1952 with 7 at Laguna Atascosa. From 1955 through the Christmas season 1970-71, high counts, if any, have in most years been in Florida.

Even in Texas, *D. bicolor* is, as yet, not entirely done for. The La Sal Vieja Christmas Count turned up a whopping and freakish 377 in 1967; Flour Bluff near Corpus Christi counted 53 in 1968. Even breeding is still going on in the wetter years. During 1968, broods of young were noted at Rockport and on Welder Wildlife Refuge on the central coast; near Falfurrias, located inland from the lower coast; and in the Willamar pocket of Willacy County in the Rio Grande delta. At the latter locality 200 adults and at least 60 downy young were observed by J. H. Pierce.

Causes of the spectacular twentieth-century changes in status and distribution of the Fulvous Tree Duck are difficult to determine. However, it is tempting to speculate that something like the following happened: At some time before the mid-nineteenth century, *D. bicolor* moved northward into Texas from the large permanent marshes in the vicinity of Tampico, Tamaulipas in northeastern Mexico. At first it resided in the Rio Grande delta—the part of Texas most like its Mexico

home. With the great expansion of rice culture, which started in World War I on the upper Texas coast, thousands of acres of food-rich artificial marsh became very suitable for Fulvous Tree Ducks, which then moved northward to take advantage of the newly created optimum habitat. During the mid-twentieth-century range expansion, refugee birds, perhaps seeking less poisoned marshes, wandered north and east of the Texas rice belt, moving especially to warm climates since the Fulvous is primarily tropical. Florida wetlands were suitable for wintering but apparently not so good for nesting. In the late 1960's, the Fulvous returned in fair numbers to deep south Texas; it had largely abandoned this region in the early 1900's, probably because the area is subject to frequent droughts which dry up the marshes.

In summary, prime nesting habitat for the Fulvous Tree Duck is a well-irrigated rice field, but some individuals are adaptable enough to go elsewhere when water, mud, and rice become overly toxic.

DETAILED ACCOUNT: NO SUBSPECIES

North American birds segregated as *D. b. helva* by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Pileum tawny; hindneck ochraceous tawny to tawny, with narrow middle line fuscous black; well-marked broad collar of fuscous black streaks on middle of neck; back, rump, wings, and tail fuscous black, broadly edged on back and scapulars with tawny and russet; lesser wing-coverts chestnut brown; upper tail-coverts black or chaetura black, longest feathers white; throat cinnamon buff, lower throat with collar of fuscous and white streaks continuous with similar area on sides and back of neck; breast cinnamon to ochraceous tawny, verging toward tawny posteriorly; long ornamental feathers on side and flank creamy white; crissum buffy white; lining of wing fuscous. Bill bluish black; iris dark brown; legs and feet light bluish slate color. *Adults, winter:* Acquired by complete post-nuptial molt. Very similar to nuptial adults, but colors somewhat darker, feathers of upper parts more broadly tipped with tawny. *First nuptial:* Acquired by wear from first winter. Similar to nuptial adults, with exception of retained juvenal wings. *First winter:* Acquired by nearly complete postjuvenal molt. Similar to first nuptial. *Juvenal:* Acquired by complete postnatal molt. Similar to first winter, but anterior upper parts darker, edgings of feathers darker—about auburn; upper tail-coverts tipped with dull dark brown; wing-coverts less extensively and less solidly chestnut brown; throat and lower parts paler; collar stripes obsolete; middle and posterior abdomen paler. *Natal:* Pileum, hindneck, and irregular thin stripe through eye clove brown or dark mouse gray; remainder of upper parts bister or mouse gray; sides of head extending as stripe onto back of head, supraloral stripe or spot, sometimes a line over eye, and hind edge of inner wing, also sometimes a spot on each side of back near wings, together with lower surface, dull white, somewhat tinged with gray on all but anterior lower surface. Maxilla dark plumbeous or blue-gray, nail clay color; mandible maize yellow; legs and feet deep neutral gray, claws clay color.

MEASUREMENTS: *Adult male:* Wing, 196.1-224.1 (average, 210.3) mm.; tail, 45.0-54.1 (49.8); bill (exposed culmen), 43.9-48.5 (46.3); height of bill at base, 19.0-21.6 (20.6); tarsus, 52.1-59.9 (55.9); middle toe without claw, 65.0-70.1 (66.3). *Adult female:* Wing, 201.9-225.1 (210.8); tail, 47.5-54.1 (49.8); bill, 45.0-48.5 (46.8); height of bill, 19.6-21.1 (20.3); tarsus, 52.1-56.9 (55.3); middle toe, 64.0-70.1 (66.8).

TEXAS: *Breeding:* Collected northeast to Colorado, Harris, and Galveston, southwest to Nueces and Cameron cos. *Migration:*

See species account. *Winter*: Taken in Colorado, Fort Bend, Calhoun, Aransas, Kleberg, and Cameron cos. *Vagrant*: Four specimens: El Paso Co., Rio Grande near Ysleta (May 22, 1940, T. M. Kirksey); Tom Green Co., North Concho Creek near San Angelo (3 on Mar. 1, 1885, W. Lloyd).

NESTING: *Nest*: In marshes, marshy woodlands, or swamps, chiefly on grassy ground in natural marshes or in rice fields, rarely in cavity in tree; composed of grass, sedges, tules, and, when in tree, chips of wood at bottom of cavity; lined with fine grass and down. *Eggs*: 8–36 (larger number probably laid by more than one female), usually 11–17; short ovate, rounded ovate, ovate, or oval; usually smooth, sometimes glossy; pure white or buffy white; unmarked but often nest stained; average size, 53.3 × 40.6 mm.

MALLARD, *Anas platyrhynchos* Linnaeus

SPECIES ACCOUNT

See colorplate 1

Anas platyrhynchos of A.O.U. check-list, 1957 (see Appendix A). Also known as Greenhead. A large pond duck with red-orange legs. In flight, shows (above) iridescent purplish blue speculum (mirror) bordered fore and aft with white; (below) white wing-linings. *Male*: yellowish bill; glossy green head, neck; thin white neck-band; rusty chest; brownish back concealed largely by pale grayish scapulars; black rump, base of tail, and crissum; whitish sides and abdomen; white flank-patch; black recurved feathers on top of white tail. *Female*: blackish-mottled orange bill; buff and brown mottled above, on chest, sides, crissum; blackish crown and line through eye; whitish outer tail feathers; buffy breast, belly. Length, 23 in.; wingspan, 3 ft.; weight, 2¾ lbs.

RANGE: N.w. North America, Greenland, Iceland, Scandinavia, n. Russia, c. Siberia, and Kamchatka, south to w. and n.e. United States, s. Europe, Iran,

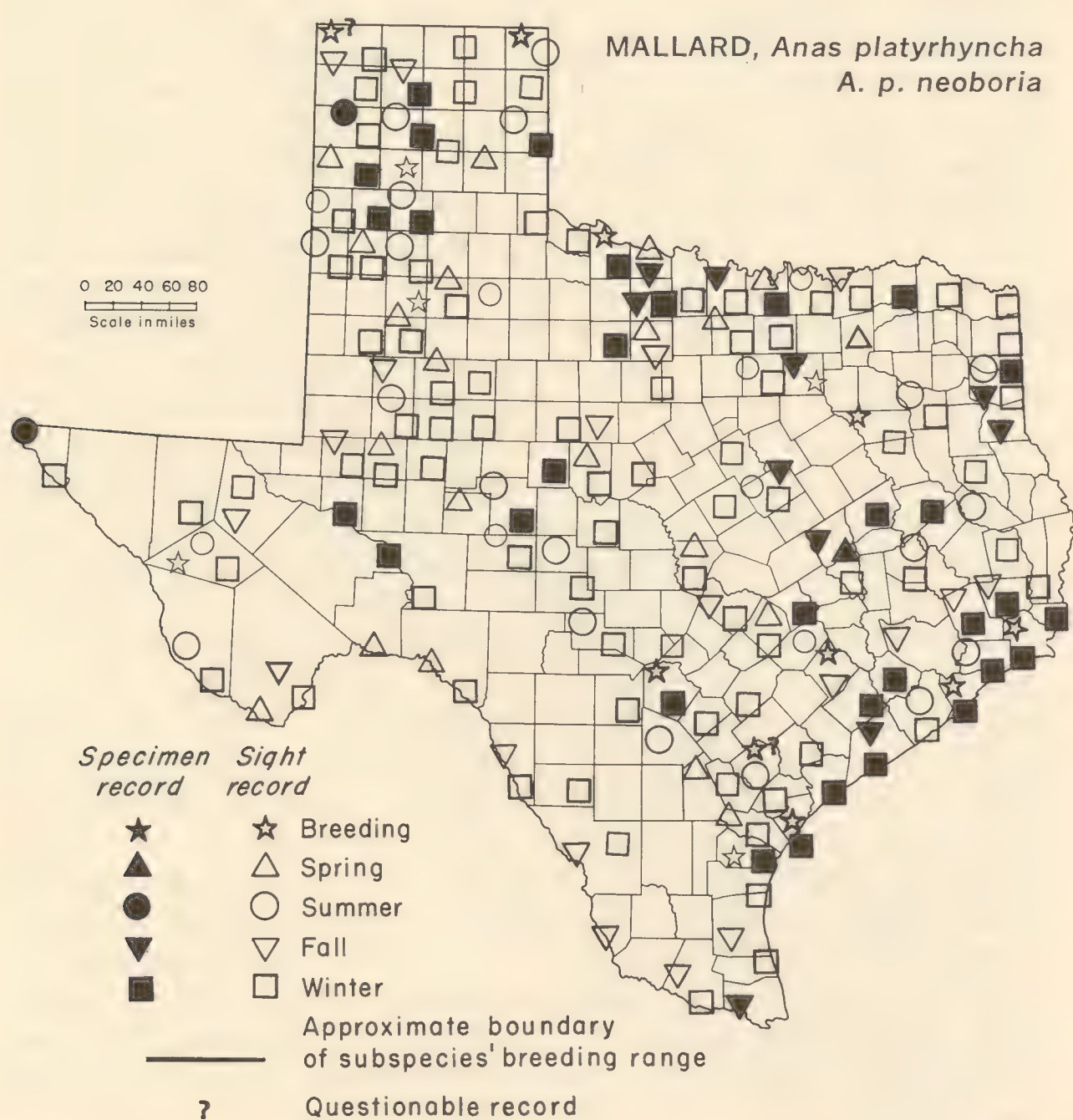
Tibet, Manchuria, and Japan. Winters from southern part of breeding range to Madeira and Canary Islands, Ethiopia, India, Burma, Borneo, Guatemala, and West Indies.

TEXAS: (See map.) *Breeding*: Feb. to early Aug. (eggs, Feb. to May 17; small young, Apr. 26 to Aug. 11) from near sea level to about 3,900 ft.—perhaps to 4,500 ft. Rare—formerly scarce to rare—and highly irregular throughout (except extreme south), chiefly in northwest portion and on upper and central coasts. Reported breeding in Dallam (1937, unconfirmed), Lipscomb (1924), Randall (1969), Lubbock (1966), Wilbarger (1928), Dallas (1969), Henderson (1939), Jefferson (1917, 1933), Galveston (1931), Colorado (1937), Goliad (1929, unconfirmed), San Patricio (1928), Nueces (female apparently mated to male Mottled Duck with 3 young typical of Mottled, July 8, 1965, G. W. Blacklock), Bexar (1928), and Jeff Davis (1960's, Pansy Espy) cos. *Winter*: Sept. to Apr. (extremes: Aug. 9, June 10). Locally abundant in Panhandle; fairly common to rare in remainder of state.

HAUNTS AND HABITS: Throughout the historic period, in both America and Europe, people have regarded the classic Mallard as the most important duck species. Manufacturers of hunting gear continue to decorate countless sleeping bags, drinking glasses, boxes of shotgun shells, etc., with images of the Mallard. These decorations are always of drakes; in fact, the very name “mallard” is derived from an old French word meaning “male.” That this symbol of vigor, aggression, and wildness should be the ancestor of nearly all the earth's dull domesticated ducks is a paradox. Many domestic varieties are drastically changed in size, shape, and color from the handsome wild Greenhead, but adult males practically all show recurved feathers (black, brown, or white) on the dorsal tail surface—proof that these birds carry Mallard blood and not that of the other ancestor of tame ducks, the Muscovy of tropical America.

The famous Mallard, first species of the Anatinae, is an exemplary surface feeder. Members of this subfamily—also known as dabblers, puddle, pond, or river ducks—are distinguished from the Aythyinae—diving, bay, or sea ducks—chiefly by their feeding and flushing habits. Anatinae tip up and dabble in shallow water, usually twelve to sixteen inches deep, rather than diving; and they take off from the water with a strong vertical spring, instead of pattering along the surface to become airborne. Furthermore, pond ducks, although web-footed, lack an added advantage for swimming and diving present in the Aythyinae—a lobe on the hind toe.

Anas platyrhynchos, though it occurs over practically all of the United States, is most common in the West, while the Black Duck prevails to the northeast. From the main breeding areas in Canada, Mallards begin moving south in force in late September and early October. They winter as far north as there is open water, but prime winter haunts are on freshwater ponds, swamps, streams, and lakes in the lower Mississippi



Valley and on the southern Great Plains. A few appear on brackish or salt bays and estuaries, but at all seasons this duck prefers fresh water. By very early spring, the hardy Mallard is winging north again.

Flight is fast (30 to 50 m.p.h.), steady, and direct. The Mallard feeds by day or night and varies its diet to suit circumstances. In North America it is largely vegetarian. As a rule, about 90 percent of its diet comprises seeds of sedges, grasses, and smartweeds, leaves and stems—as well as seeds—of pondweeds and duckweeds, and seeds of such riverbottom trees as water elm, hackberry, oak, hickory, and baldcypress. The remaining 10 percent is worms, mollusks, crustaceans, and insects (including larvae and pupae of mosquitoes). Where possible, the Mallard forages in stubble fields for waste grain or in woods for acorns, hickory nuts, beechnuts, and pecans. In the Northwest, it feeds on rotting flesh of spent salmon.

The female utters a loud resonating *quack*; the drake, a low reedy, but far-carrying, *kwek-kwek-kwek-kwek*. A *tick-a-tic-a-tic-tic* is apparently sounded as a “feed” call. The clamorous Mallard, especially the female, is particularly chatty when feeding.

CHANGES: The noted French ornithologist Jean Delacour demonstrated his superb command of the English language when he wrote in *The Waterfowl of the World*: “The most successful group of Dabbling Ducks in the struggle for life in a man-infested world is certainly that of the Mallards . . .”

Alas, in Texas during the terrible twentieth century even the vigorous Mallard is showing signs of going down the drain. According to George Finlay Simmons in *Birds of the Austin Region*, this duck was very common in central Texas during the late nineteenth century and grew gradually scarcer as the twentieth century progressed. Only in the winter of 1917 did Simmons note a resurgence of the old abundance. The senior editor of the present work has observed birds in central and southern Texas most of the years between the late 1920's and early 1970's. During all this time he has seen barely 100 wild Mallards in the southern half of the state; by contrast he has here observed thousands of Gadwalls. Only in the extreme northern part of Texas do impressive numbers of *A. platyrhynchos* still gather. As late as 1970, Audubon Christmas bird counters in Hutchinson County on the east side of the new Lake Meredith turned up 24,062 Mallards (and only 45 Gadwalls).

Since the Mallard never has been a prolific nester in Texas during the historic period, it appears that stress on the main breeding grounds in the northern United States and Canada has reduced the number of wintering birds in the Lone Star State. Even before the 1950's—when the effects of worldwide poisoning with persistent pesticides and herbicides first became visible—millions of ducks, prominent among them Mallards, died of botulism (western duck sickness) and lead poisoning. In feeding, ducks mistake spent lead shot pellets for seeds or for grit which helps their gizzards grind up food. Alexander Wetmore found by experi-

ment in Utah in 1919 that six or more swallowed pellets of number six shot always proved fatal to any duck. The usual dead duck he found contained from fifteen to forty shot, and one Mallard that he picked up at the mouth of the Bear River had seventy-six pellets in its stomach.

The duck stamp, which at mid-twentieth century became obligatory for all U.S. duck hunters, is earmarked for purchase of waterfowl nesting marshes. If enough of these marshes can be saved from draining for agriculture, highways, and industry and if, in addition, shot made of lead could be banned, then it may be possible for some wild ducks to reach the twenty-first century.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN MALLARD, *Anas platyrhynchos neoboria* Oberholser, new subspecies (see Appendix A)

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Whole head, neck, and throat all around metallic grass green or cossack green, forehead blackish; lower neck with narrow collar of white interrupted behind; below this, the back is olive brown to buffy brown anteriorly, becoming fuscous and fuscous black on lower back and rump, feathers with lighter edgings, lower rump metallic blackish green like longer upper tail-coverts; shorter upper tail-coverts white or grayish white, vermiculated with light hair brown; tail light hair brown or drab gray mottled and very broadly margined with white; central rectrices black and recurved; primaries and secondaries fuscous; tertials dull smoke gray mottled with drab and dark brown; inner scapulars dull mouse gray or neutral gray, vermiculated with dull white; outer scapulars and outer edges of a few secondaries vandyke brown or burnt umber; lesser wing-coverts between hair brown and grayish olive; speculum metallic berlin blue to violet, margined anteriorly and posteriorly with black and then broadly with white, latter forming two conspicuous wing-bands; jugulum and breast bay, somewhat lighter posteriorly; remainder of lower parts dull grayish white, vermiculated with hair brown, drab, drab gray, mouse gray, and neutral gray, most strongly on sides and flanks. Bill greenish yellow or lemon yellow, but culmen and nail dull black; iris dark brown or hazel; legs and feet orange or reddish orange, brick red, or coral red. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female, but wings mostly as in winter-nuptial adult male; mantle and crown more uniform. Bill dull olive green. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Pileum chaetura black, streaked with pale buff; hindneck finely streaked with fuscous and dull buff; remainder of upper parts fuscous or fuscous black; tail fuscous; all feathers mottled with buff and white in form of irregular bars or V-shaped markings of light buff or dull white; tail feathers irregularly barred with buff and buffy white; wing-quills light fuscous or dull hair brown; lesser coverts between hair brown and drab, very narrowly margined with pale buff; speculum as in male; chin and throat pale pinkish buff, sometimes narrowly streaked or spotted with dull hair brown; rest of under parts cinnamon and buff; feathers all with central spot of fuscous. Bill greenish olive, yellow, or orange buff, but culmen and nail clove brown, sepia, or black, often extending in blotches to sides of bill; iris vandyke brown, burnt umber, or russet; legs and feet ochraceous rufous, dull orange, or rufous, but webs of toes drab; claws drab to black. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but feathers of crown, mantle, and scapulars more narrowly edged with buff, mantle without bars of buff, scapulars less numerous streaked with buff; innermost secondaries lacking any streaks of buff, and some less deeply marked with tawny or chestnut. *Male, first nuptial*: Acquired by

wear from first winter. Similar to first winter male. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to adult male, but differs in usual retention of some juvenal feathers on upper parts. *Female, first nuptial*: Acquired by wear from first winter, with which it is practically identical. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to adult female, except for worn inner secondaries retained from juvenal. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female, but feathers of tail much more sharply pointed; coloration darker and more brownish, particularly on breast and back. Maxilla slate black or dark olive, but base and mandible ochraceous buff, nail of maxilla tipped with ecru drab; iris sepia, olive brown, or seal brown; front of legs and sides of toes tawny olive or orange; rest of legs and feet clove brown; claws vandyke brown. *Natal*: Upper parts anteriorly clove brown, posteriorly sepia; sides of head, superciliary stripe, and lower parts dull napoleon yellow; postocular and loreal stripes and spot on auriculars clove brown; edging on rear of inner wing whitish; spot on each scapular and one on each side of rump dull yellow. Maxilla dark olive; mandible drab; iris dark brown; tarsus and feet dark olive and drab.

MEASUREMENTS: *Adult male*: Wing, 271.0–296.9 (average, 282.2) mm.; tail, 83.1–95.5 (90.2); bill (exposed culmen), 54.1–58.9 (56.1); height of bill at base, 20.1–22.1 (21.4); tarsus, 45.0–49.0 (47.0); middle toe without claw, 50.0–56.4 (54.3). *Adult female*: Wing, 257.0–276.1 (264.7); tail, 81.0–90.9 (85.6); bill, 49.5–55.1 (52.1); height of bill, 19.0–22.1 (20.3); tarsus, 41.9–46.5 (43.9); middle toe, 48.0–52.1 (50.3).

TYPE: Adult male, no. 283202, U.S. National Museum, Biological Surveys collection; La Lasine, Athabaska River, Alberta, Canada; May 13, 1920; J. A. Loring, original no., 991.

RANGE: N.W. Alaska to n. Manitoba, s. Ontario, and New Brunswick, south locally and irregularly to c. California (formerly to n. Baja California), Arizona, s. New Mexico, Texas, Illinois, and Virginia. Winters chiefly from Aleutians, c. Alaska, c. British Columbia, Minnesota, and Chesapeake Bay through Mexico to Guatemala (rarely), casually to Panama; also rarely Bahamas and Cuba.

TEXAS: *Breeding*: See species account. *Winter*: Taken north to Moore, east to Marion and Orange, south to Cameron, west to Pecos cos.

NESTING: *Nest*: On prairies, dry slopes, marshes, in cultivated fields, or woodlands; slight depression in ground, usually beside,

but sometimes far from, water, occasionally in tree; made of reeds, grasses, flags, and leaves; lined with down. *Eggs*: 5–15, usually 8–12; ovate to elliptical ovate; yellowish white, greenish white, pale greenish buff, light greenish or grayish buff, or dull white; unmarked; average size, 57.7 × 41.7 mm.

MEXICAN DUCK, *Anas diazi* Ridgway

SPECIES ACCOUNT

Often regarded as a “hen-feathered” race of the Mallard. Both sexes are very similar to female *Anas platyrhynchos*, but with brown (not whitish) outer tail feathers; brown markings of breast and belly more numerous, causing body to appear somewhat darker; iridescent speculum almost the same but tending toward green-blue (not violet blue), also the white front border of the speculum may be mixed with dusky or buff. Female’s bill is often less blackish-mottled, but male’s unmarked yellowish bill is like that of male Mallard. Length, 22¾ in.; wingspan, 35½; weight, 3 lbs.

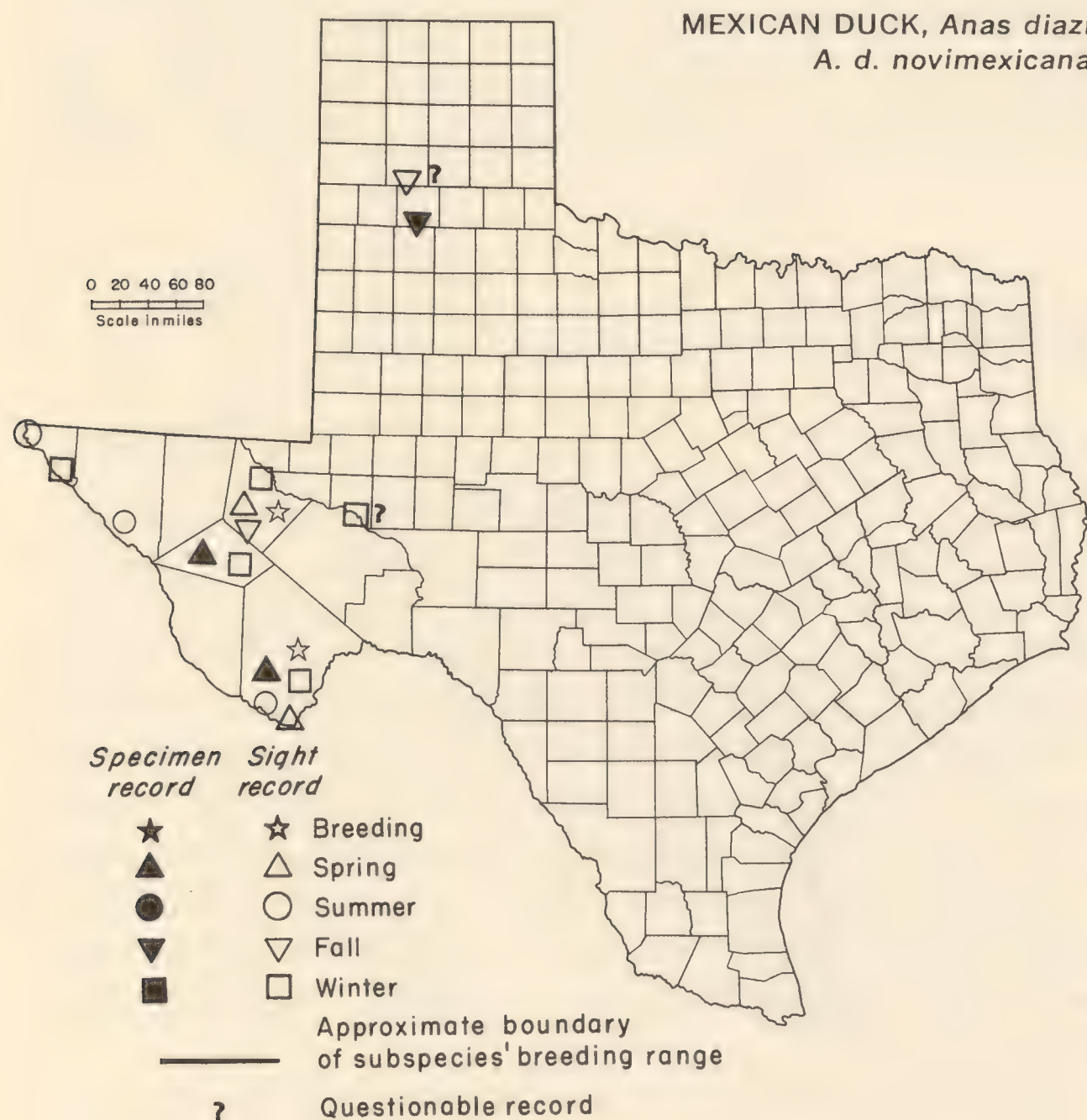
RANGE: Rio Grande Valley of New Mexico and Trans-Pecos Texas, and in high plateau of n. and c. Mexico, south to Michoacán and Puebla. Range in United States somewhat muddled by hybridization with Mallard.

TEXAS: (See map.) *Resident*: Two records of breeding: Reeves Co., between Toyahvale and Balmorhea (hatched young found in irrigation ditch, Pansy Espy); Brewster Co., 16 mi. southeast of Alpine (adult with 6 young, June 18, 1969, H. M. Ohlendorf and R. F. Patton). Locally uncommon to rare in Trans-Pecos—El Paso, Hudspeth, Jeff Davis, Reeves, Brewster, and probably Presidio cos.—chiefly in winter, spring, and fall; casual in Swisher Co., near Vigo (1 killed, fall 1951, D. Foreman), and Randall Co. (Oct., 1949, H. F. Saunders).

HAUNTS AND HABITS: The Mexican Duck and kin illustrate a curious biological phenomenon. In general, tropical birds—including some low-latitude ducks—tend to be brightly colored, but warm-climate close relatives of northern-nesting waterfowl are usually dull colored. Thus, in and near North America, drakes of Mallards, including the only slightly migratory Greenland race, *A. p. conboschas*, are brilliant; in marked contrast, the Laysan Duck, *A. laysanensis*; Hawaiian Duck, *A. wyvilliana*; Mottled Duck; and Mexican Duck are all very soberly attired in female Mallard brown. The fairly-cold-country Black Duck, *A. rubripes*, seems to be an exception to the rule. Perhaps this sooty bird evolved in anticipation that its range would become soot-begrimed with the coming of the Industrial Revolution!

In the Southwest and in Mexico the Mexican Duck inhabits tule-, grass-, or sedge-lined rivers, irrigation ditches, ponds, and shallow lakes in elevated arid country—locally wet flatlands in view of desert mountains. In Texas the Mexican Duck is regularly seen, at least by large numbers of bird watchers, only at Balmorhea Lake in Reeves County, just east of the Davis

MEXICAN DUCK, *Anas diazi*
A. d. novimexicana



Mountains. As late as the 1970 Audubon Christmas Count, 19 individuals were observed on this fairly old artificial lake.

In behavior the Mexican Duck is frequently said to be Mallard-like but more wary and reclusive. However, it is possible that observers making the comparison have in mind the habits of more or less domesticated Mallards. Chiefly after dusk, *A. diazi* feeds on river bank mud flats, in drainage canals, sloughs, and like places, on green shoots of cattails, alfalfa, and other plants, seeds of weeds and grasses, and a few small freshwater mollusks.

Vocalizations resemble those of the Mallard.

CHANGES: The Mexican Duck's aridland river, lake, and marsh haunts have been drying up ever since the end of the last Ice Age, some ten thousand years ago. During the twentieth century this natural desiccation is greatly worsened by man's drainage of swamps and diversion of rivers for agricultural and industrial purposes. Most of the remaining waterfowl wetlands have been civilized to the extent that they are more suitable for Mallards. In New Mexico there is considerable ongoing interbreeding of *A. diazi* and *A. platyrhynchos*. This hybridization threatens the purity of the few Mexican Ducks remaining in the United States.

The committee on rare and endangered species, U.S. Bureau of Sport Fisheries and Wildlife, reported in July, 1966, that there were about 150 Mexican Ducks in the wild in Texas, between 100 and 150 in New Mexico, none in Arizona, and 1,000 in the Babicora section of the large Mexican state of Chihuahua. As of 1964 there were approximately 70 captives; these were held mostly in New Mexico for breeding purposes. The committee considered reproductive potential in captivity good—unlike that of most other endangered species.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN MEXICAN DUCK, *Anas diazi novimexicana* Huber

New Mexican Duck of older authors.

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Much like female Mallard but with much less white or buff on tail; upper parts less broadly edged with buff or cinnamon; lower surface much darker, more heavily streaked or spotted with dark brown. Upper parts fuscous or fuscous black; pileum narrowly streaked or margined with buffy white; hindneck finely streaked with pale buff; feathers of remaining upper parts broadly margined with pinkish buff and other shades of buff; tail fuscous, with irregular bars and streaks of white and pale buff; wing-quills fuscous; wing-coverts hair brown, except inner ones, which are like back, and all narrowly margined with pale buff, brownish, or buffy white; speculum metallic berlin blue to grass green and violet, broadly margined with velvety black, and then broadly with white, the latter forming two conspicuous wing-bars; chin, throat, and sides of head and of neck pinkish buff to dull buff, chin and middle of throat usually nearly or quite unmarked, rest narrowly streaked or finely spotted with fuscous; remainder of lower parts buffy brown or olive brown, broadly streaked with cinnamon buff, dull buff, and pinkish buff; sides and flanks darkest and feathers narrowly margined with various shades of buff; lining of wing white. Bill pyrite yellow, oil yellow, bright yellow, or orange, sometimes with tinge of green, the nail and extreme base near

gape black, the nostrils tinged with brown; iris dark brown; legs and feet grenadine orange or dull orange vermillion. *Adult female, nuptial:* Acquired by partial prenuptial molt. Plumage like that of nuptial adult male, though usually lighter below, especially on jugulum. Bill dull orange, base of maxilla olive green, top and sides of culmen dark olive, nail and spots on sides of bill black; iris dark brown; feet vermillion, tinged with orange. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding sex in nuptial adult. *First nuptial:* Acquired by partial prenuptial molt. Resembling nuptial adults, but averaging more heavily or numerous dark-streaked below, with more rufescent cinnamon suffusion on jugulum. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but more heavily streaked with dark brown; upper surface and often edgings of feathers darker; on under surface averaging more deeply rufescent cinnamon on jugulum and remainder of lower surface; throat streaked with black. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but feathers of upper parts less broadly edged with buff, dark streaks of lower surface averaging narrower and often lighter in color. Differs from first winter in much the same manner, but even more decidedly. *Natal:* Unknown.

MEASUREMENTS: *Adult male:* Wing, 260.1–279.9 (average, 272.3) mm.; tail, 93.0–108.0 (96.0); bill (exposed culmen), 50.0–56.9 (52.8); tarsus, 39.9–50 (46.3); middle toe without claw, 48.0–56.9 (51.8). *Adult female:* Wing, 244.1–262.1 (253.5); tail, 87.9–94.0 (90.7); bill, 47.5–54.1 (50.5); height of bill at base, (18.5); tarsus, 42.9–48.0 (45.7); middle toe, 45.0–54.1 (49.8).

RANGE: Extreme s.e. Arizona (perhaps recently extirpated) and Rio Grande Valley of New Mexico (north, formerly at least, to Albuquerque) and Trans-Pecos Texas, south to n. Chihuahua.

TEXAS: *Resident:* Two specimens: Jeff Davis Co., 14 mi. northeast of Fort Davis (female, Apr. 10, 1970, H. McDermitt; Sul Ross State University collection, no. 473; identified by J. W. Aldrich); Brewster Co., 10 mi. west of Marathon (female, Mar. 28, 1967, J. F. Scudday; Texas A&M University collection, no. 7382). One hybrid Mexican Duck × Mallard specimen: El Paso Co., Belen (male, June 19, 1893, E. A. Mearns; U.S. Nat. Museum collection, no. 134686).

NESTING: *Nest:* In marsh, near or on the edge of a lake, or in brush near water; in rushes, sedges, or grass over shallow water, a short distance above surface, or in midst of a bush, such as tornillo (*Prosopis pubescens*), on ground in a hollow; composed of leaves of rushes, sedges, grasses, or other vegetation; lined with down or other feathers. *Eggs:* 2–9; broad elliptical ovate; smooth but not glossy; dull greenish white, white washed with yellowish glaucous, or pale greenish buff; unmarked; average size, 58.7 × 41.1 mm.

BLACK DUCK, *Anas rubripes* Brewster

SPECIES ACCOUNT

See colorplate 1

Often called American Black Duck to distinguish it from dusky ducks of other continents. A large unadorned dabbler with yellowish bill (greenish in female and eclipse male); orangish legs. Pale gray-brown head and neck, finely streaked and flecked with blackish; dusky line through eye; sooty brown on remainder of body; male darker than female. In flight, wing shows (above) violet blue speculum trimmed very inconspicuously on rear edge with white; (below) white wing-linings in contrast with dark flight feathers and body. Length, 23¼ in.; wingspan, 3 ft.; weight, 3 lbs.

RANGE: N. Manitoba, n. Ontario, Labrador, and

Newfoundland, south to Minnesota, n. Illinois, Virginia, and North Carolina. Winters chiefly from Minnesota, s. Ontario, Nova Scotia, and s. Newfoundland to e. Texas, Gulf states, and Florida; also Bermuda.

TEXAS: (See map.) *Winter*: Sept. to May (extremes: Aug. 3, May 11). Uncommon—formerly fairly common—to rare in eastern third; rare and irregular west to Deaf Smith, Bailey, Reagan, Kimble, and Medina cos.; casual in Trans-Pecos (Big Bend Nat. Park, Dec. 10, 1967, R. H. Wauer; El Paso region, Sept. 13, 1970, M. P. Schultz).

HAUNTS AND HABITS: The Black Duck is the common wild dabbler of northeastern United States. It prefers fresh or brackish marshes near seacoasts but is remarkably tolerant of salt, and even polluted, water. Ponds in Central Park, New York City, support numerous Black Ducks which compete well with semidomestic Mallards. The Black hides its nest—a bulky cup of leaves and grass, well lined with down—on the ground among cattails and willows at marsh- or pond-edge. However, an occasional nest has been discovered in an abandoned crow or hawk nest high in a tree. This duck leaves its summer haunts early in the fall but remains on inland waters even when these are partially frozen; ultimately most birds reach salt marshes and bays, chiefly along the Atlantic coast. The southwestern limit of its winter waters is the Texas Gulf coast where the Black is often confused with female Mallards and resident Mottled Ducks.

On the wing, it moves swiftly, usually high in the air, and with rapid wing-strokes. It is a buoyant and speedy swimmer and rises off the water with a strong vertical thrust. Away from city parks, the Black is considered one of the wariest and most alert of ducks; hunting pressure has converted it largely to a noctur-

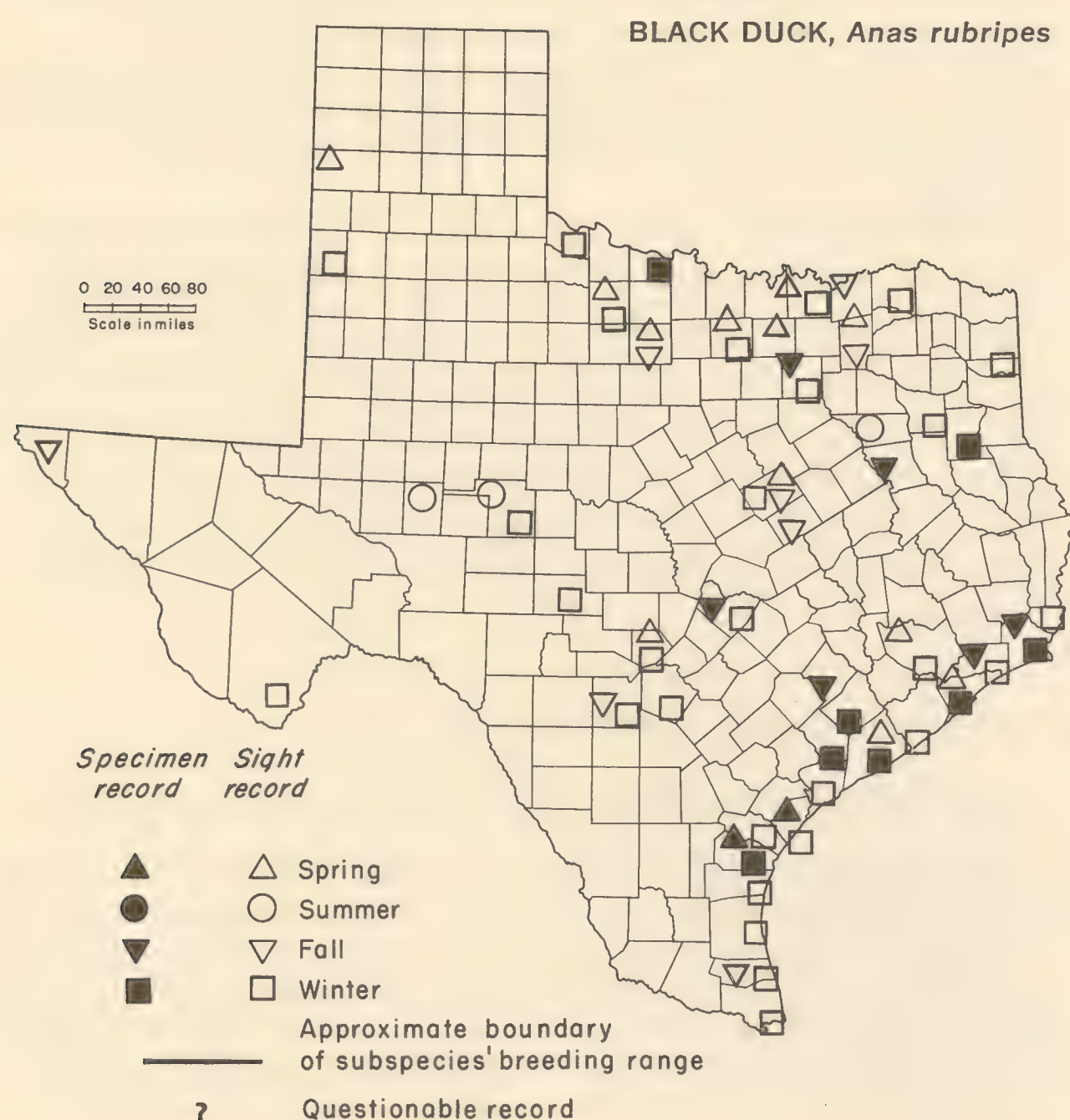
nal feeder. With nightfall, it moves to shallows, where it tips up and wades for submerged and shoreline plants, including pondweeds, eelgrass, and seeds of sedges and grasses. Walking with ease on land, it makes autumnal visits to wheat, barley, and buckwheat fields (rice in the South) for grains, also to woods for acorns and beechnuts. It consumes more protein, especially during cool months, than the Mallard. Animal matter is chiefly blue mussels, periwinkles, shrimp, and sand fleas, obtained, for the most part, on coastal mud flats. For safety, Blacks rest during the day in rafts well offshore in open—at times on frozen—water. Like the Herring Gull, *Anas rubripes* can stand indefinitely on a cake of ice without getting frozen feet.

The drake's *quack*'s are weak, low, and reedy, while those of the more vocal female are loud, resonant, and Mallard-like. Black Ducks are very talkative while feeding.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, winter and nuptial plumage*: Male usually darker than female. Acquired by nearly complete postaestival molt. Upper parts fuscous black; top of head narrowly and slightly streaked with pinkish buff to middle of crown; remainder of upper parts narrowly streaked and margined with dull cinnamon; wings and tail fuscous; wing-coverts narrowly margined, sometimes obscurely, with buffy white, tertials with dull cinnamon buff; speculum metallic berlin blue to violet or myrtle green, margined posteriorly with broad band of black and this, in turn, with very narrow buffy white margin on tips of secondaries, this forming inconspicuous wing-band; outer webs of longest tertials black; lining of wing white, spotted exteriorly with fuscous; sides of head and of neck and all of throat pinkish buff, heavily streaked, except on chin, with fuscous or fuscous black; jugulum clove brown, male with feathers of sides of jugulum with U-shaped buff markings, these V-shaped in female; remainder of under surface dull olive brown, irregularly streaked with ochraceous buff or cinnamon, this chiefly on edges of feathers. Bill olive buff, ocher yellow, yellowish tawny olive, rinnamon green, or greenish yellow, mottled with black in female, nail partly or wholly black; iris vandyke brown; legs and feet of male orange-red, bittersweet pink to oriental pink, orange, coral red, or rufous, but webs of toes drab; legs and feet of female duller, more brownish like juvenal; claws slate black. *Adults, eclipse*: Acquired by partial postnuptial molt. Similar to winter-nuptial adults, but feathers of sides of jugulum without U-shaped or V-shaped buff markings; light edgings of all feathers somewhat narrower. Bill, legs, and feet of male duller. *First winter and nuptial*: Acquired by partial postjuvinal molt. Like winter-nuptial adults. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults but usually smaller; lower parts more striped in appearance. Bill duller, maxilla greenish olive yellow, buffy olive, olive buff, or dull olive, sometimes tinged with black on culmen, but nail slate black or black; mandible dark olive buff, olivaceous drab, wood brown, or ochraceous buff; bare space on chin black, drab, or ochraceous buff; iris vandyke brown, burnt umber, or hair brown; legs and feet vinaceous cinnamon, light rufous, pale ochraceous, or dull pink, but webs of toes chaetura black, drab, or black; claws brownish black, chaetura black, slate black, or dull black.

MEASUREMENTS: *Adult male*: Wing, 262.1–289.1 (average, 278.4) mm.; tail, 85.1–99.1 (91.9); bill (exposed culmen), 49.0–59.9 (53.8); height of bill at base, 19.0–24.9 (21.4); tarsus, 43.9–49.0 (46.5); middle toe without claw, 51.1–58.4 (54.3). *Adult female*: Wing, 247.1–270.0 (260.4); tail, 80.0–94.0 (87.6); bill, 49.0–55.1 (51.3); height of bill, 19.6–23.1 (20.6); tarsus, 42.9–46.0 (43.7); middle toe, 48.5–55.1 (51.3).



TEXAS: *Winter*: Taken northwest to Wichita, east to Rusk and Jefferson, south to Nueces cos.

MOTTLED DUCK, *Anas fulvigula* Ridgway

SPECIES ACCOUNT

Considered conspecific with Mallard by Delacour, Voous, and others; often called Florida Duck when treated as race of Mallard. Resembles female Mallard, but with unmottled yellowish bill (not blackish-pied orangish); has white only on rear edge of speculum (not fore and aft white borders); brown (not whitish) outer tail feathers. Also very similar to Black Duck—both have flashing white wing-linings—but body is tawnier (not so sooty) with unstreaked pale buff chin and upper throat; sparingly streaked buffy sides of head (not blackish-flecked pale gray-brown); iridescent speculum more greenish (less purplish) blue. Length, 21¾ in.; wingspan, 34¾.

RANGE: Coastal region of Texas and Louisiana; also peninsular Florida from vicinity of Gainesville to Cape Sable and Key Largo.

TEXAS: (See map.) *Resident*: Breeds, early Mar. to Aug. (eggs, Mar. 18 to July 21; downy young, Apr. 3 to July 12; flightless young to Aug.) from near sea level to about 170 ft. Locally common to uncommon along entire coast and for a short distance inland; uncommon—formerly fairly common—to scarce farther inland to Orange, Jasper, Austin, Colorado, Victoria, Goliad, Live Oak, Jim Wells, and Hidalgo cos.; rare vagrant in Bexar, Travis, McLennan (may have bred?), and Dallas cos.; may have bred in Dallas Co. (adults, June 21–Aug. 15, 1970, 4 ducklings believed to be Mottled Ducks studied, Aug. 15, 1970, Hazel Nichols, et al.);

accidental in Irion Co., 2 mi. south of Mertzon (6 seen, July 31, 1921, R. J. Fitzgerald).

HAUNTS AND HABITS: In Texas, the Mottled is the only freely breeding, fully resident duck in the fresh and brackish marshes fringing the coast. Though its total range along the Gulf of Mexico is slim, it is more common in this state than the very similar Black Duck, which predominates in the eastern United States (north of Florida). At all seasons, *Anas fulvigula* is a duck of near-pristine grassy marshes and their mud flats, ponds, and adjacent bays. In summer it has these haunts largely to itself but in winter it is joined by the Black and the Mallard, the female of which also closely resembles the Mottled. As a rule, the resident duck is paired by January, while visiting Mallards and Blacks are not.

This duck's eating habits are notable. According to Kortright in *Ducks, Geese and Swans of North America*, the Mottled consumes more protein—about 41 percent of its diet—than any other dabbling duck: chiefly snails, other mollusks, aquatic insects, fish, and a few crayfish and similar crustaceans. Vegetable food includes primarily seeds; also soft parts of grasses, smartweeds, pondweeds, and widgeongrass.

Mottled Duck vocalizations resemble those of the Mallard.

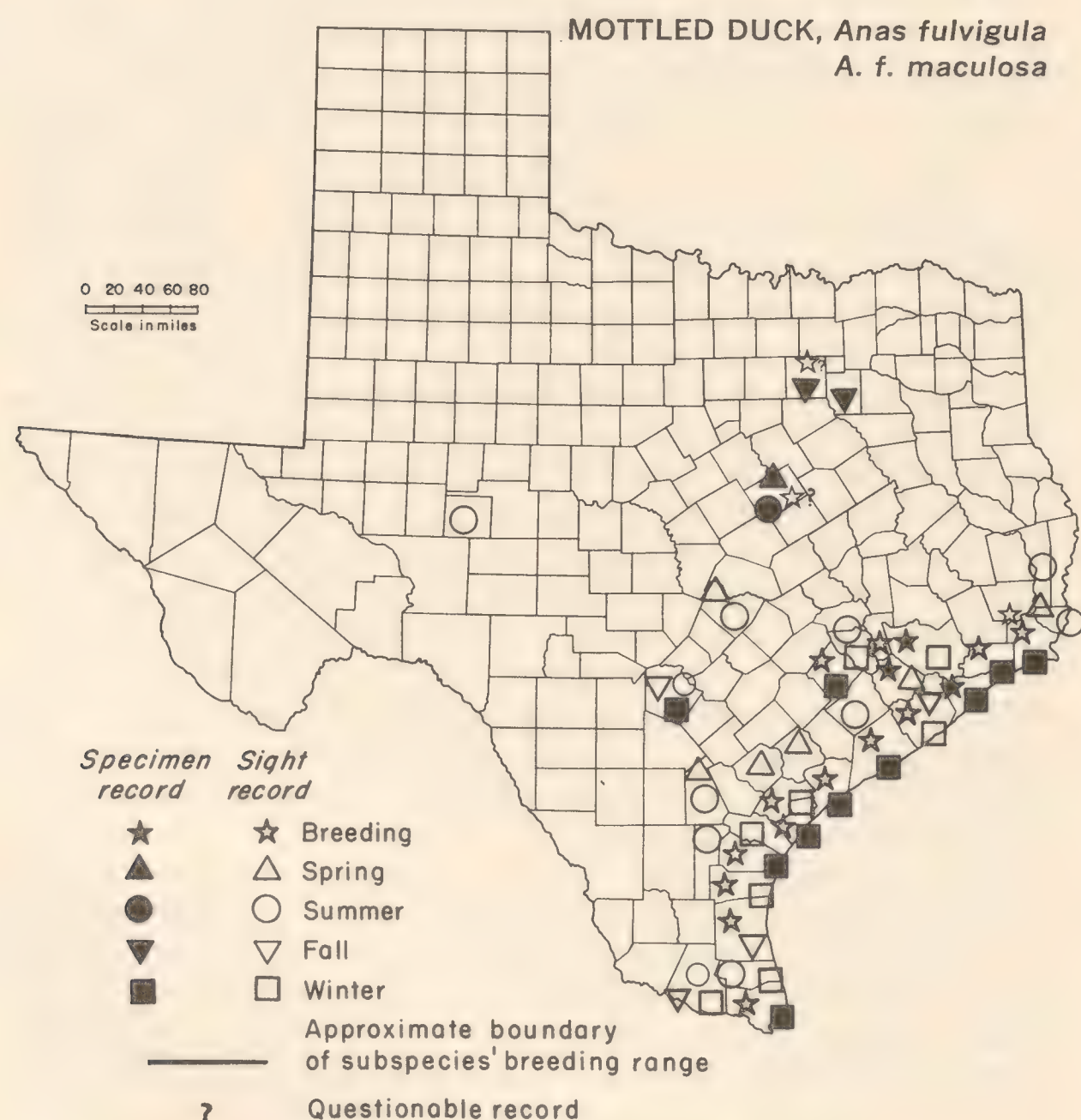
CHANGES: Except in the Houston region, where decline has been substantial, Mottled Ducks apparently have so far held their numbers fairly well against powerful adverse factors. Since the 1940's and 1950's, draining and filling of marshes, industrial and automobile pollution, poisoning of rice fields, and spraying for mosquitoes have placed *Anas fulvigula*, as well as all other living organisms, under stress. As recently as the summer of 1971, the whole Texas coast was drenched with additional pesticide in an attempt to eradicate VEE, a mosquito-borne viral disease of horses. Furthermore, nineteenth-century-style poaching continues. In fact, it was in the middle of the twentieth century that a Mottled Duck poacher shot Gus Engeling, who was Texas' leading researcher of the species.

From the late 1960's into the 1970's, several rather large protected areas have aided *A. fulvigula*. Within this bird's breeding range are five National Wildlife refuges: Anahuac (9,800 acres), Brazoria (6,367), San Bernard (14,000), Aransas (47,250), and Laguna Atascosa (45,000). Of more heroic dimension is the King Ranch, the nearly one million acres of which have been closely guarded against poaching and subdivision for a century.

DETAILED ACCOUNT: ONE SUBSPECIES

TEXAS MOTTLED DUCK, *Anas fulvigula maculosa* Sennett

DESCRIPTION: *Adults, winter and nuptial plumage*: Acquired by complete postnuptial molt. Pileum, rump, and upper tail-coverts fuscous black, pileum narrowly streaked with pinkish buff and pale pinkish buff; hindneck more numerous streaked with same color, remainder of upper parts between fuscous and olive brown; all feathers of posterior upper parts conspicuously margined with tawny or ochraceous tawny; wings and tail fuscous,



tail narrowly edged with pale buff or dull cinnamon, wing-coverts edged with pale buffy white or light dull ochraceous; speculum dark berlin blue to dark metallic green, broadly margined anteriorly and posteriorly with black, and posteriorly with very narrow and inconspicuous white tips of secondaries, outer webs of longer tertials black to fuscous black; lining of wing white; sides of head pale pinkish buff, slightly grayish, conspicuously or narrowly streaked with fuscous; chin and upper throat pinkish buff, unmarked; lower throat marked with spots and narrow short streaks of fuscous; remainder of lower parts fuscous streaked with cinnamon, cinnamon buff, and tawny to ochraceous tawny. Bill olive yellow or greenish with black spot at base of lower edge of maxilla; iris dark brown; legs and feet reddish orange. *First winter and nuptial*: Acquired by partial postjuvinal molt. Like winter nuptial adults, except wings retained from juvenal. *Juvenal*: Acquired by complete postnatal molt. Similar to adults, but broad edgings of back and lower parts paler; dark markings of breast more lengthened; wings duller, speculum much duller and smaller, and black border narrow and duller. *Natal*: Upper parts dull brown, lighter on forehead; sides of head and superciliary stripe isabella color; chin and throat cream buff; lores and postocular stripe brownish; remainder of lower parts dull buff; edge of wing, scapulars, and rump spots cream buff.

MEASUREMENTS: *Adult male*: Wing, 245.1–267.0 (average, 256.8) mm.; tail, 85.1–93.0 (88.1); bill (exposed culmen), 52.1–63.0 (55.3); height of bill at base, 19.6–22.6 (20.9); tarsus, 42.9–48.0 (45.7); middle toe without claw, 51.1–57.9 (53.6). *Adult female*: Wing, 227.1–261.1 (238.8); tail, 80.0–88.9 (85.1); bill, 48.0–55.9 (51.8); height of bill, 18.0–21.1 (19.6); tarsus, 39.9–45.0 (41.7); middle toe, 47.0–52.1 (49.3).

RANGE: Coastal prairies and marshes of Texas and Louisiana. Wanders inland during nonbreeding season.

TEXAS: *Resident*: Collected northeast to Harris, Jefferson, and Chambers, southwest to Colorado, Refugio, Aransas, Kleberg, and Cameron cos. *Vagrant*: Collected in Dallas, Kaufman, McLennan, and Bexar cos.

NESTING: *Nest*: In marshes, on prairies, or in more or less grass-covered sandy areas, often at some distance from water; slight depression amid grass or in grass tufts, usually well concealed; made of rushes, grass, reeds, and feathers; lined with down, feathers, and fine bits of vegetation. *Eggs*: 6–11, usually 7–10; elliptical oval to oval; pale greenish buff, greenish white or cream white, unmarked; average size, 54.8 × 40.4 mm.

GADWALL, *Chaulelasmus streperus* (Linnaeus)

SPECIES ACCOUNT

See colorplate 2

Anas strepera of A.O.U. check-list, 1957 (see Appendix A). A medium-sized, plain pond duck with blackish bill (yellowish-tinged in female); yellow legs; in flight, flashes small white square patch on rear of inner wing (most conspicuous on top side). *Male*: dark brown crown; blackish-streaked buffy head and neck; dark grayish back, chest, sides, flanks; white breast, belly; black crissum. *Female*: buff and brown mottled upper parts (darkest on crown and back), chest, sides, and crissum; whitish breast, belly. Length, 20 in.; wingspan, 34¼; weight, 2 lbs.

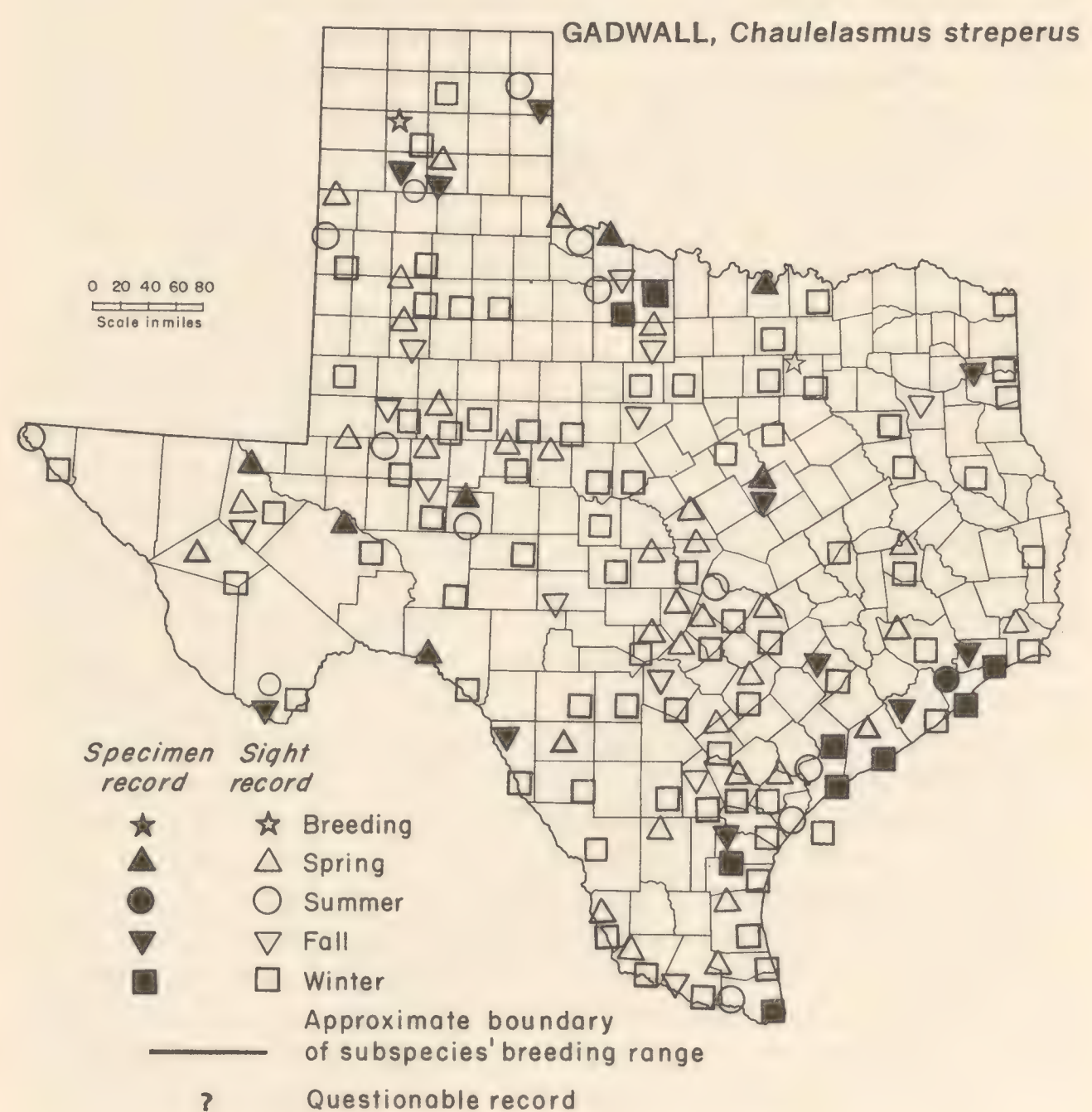
RANGE: Discontinuously Holarctic, in s.e. Alaska, and from s. British Columbia to c. Manitoba and s. Quebec (St. Lawrence River), south locally and irregularly to c. California, Arizona, n.w. New Mexico, n. Texas, Colorado, and Nebraska, rarely from Long Island to North Carolina; also in Iceland, Scotland, e. England, s. Sweden, and from n. Europe and s. Siberia (east to

Lake Baikal), south to Romania, n. Iran, and Afghanistan. Winters chiefly from Oregon, Colorado, Texas, Gulf states, Chesapeake Bay, British Isles, s. Europe, s. Iran, and s. China to Baja California, Guerrero, Veracruz, Tabasco, Jamaica, Nigeria, Kenya, s. India, Burma, and Thailand.

TEXAS: (See map.) *Breeding*: Two records: Potter Co., Amarillo (female with 2 ducklings, July 27, 1945, A. S. Hawkins); Dallas Co., Dallas (July 4, 1961, 12, including 8–9 young, Hazel Nichols, C. E. Kiblinger). Scarce to rare—formerly uncommon to rare—summer lingerer throughout, especially in northwest portion. *Winter*: Early Oct. to late May (extremes: Aug. 20, June 2). Locally abundant (on a few lakes) to uncommon throughout.

HAUNTS AND HABITS: Combining its breeding and winter range, the Gadwall is one of the widest ranging of ducks. It occurs at one season or another from cold plains and partly wooded regions to hot deserts. The senior editor once saw a Gadwall standing in a tiny puddle on a road in the middle of Death Valley, California. It even winters, to some extent, in the Tropics. In North America, it breeds chiefly on prairies of southern Canada and northwestern United States. In these flat grassy areas, *C. streperus* seeks calm fresh waters growing with lush shoreline and bottom vegetation. Islets in lake districts are particularly favored nest sites.

The species is an early spring and late fall migrant; a short flight takes it to the main North American winter quarters in the lower Mississippi Valley and Mexico. Even during cold months, the Gadwall prefers fresh water. In the vicinity of Austin, central Texas, it winters on large artificial lakes of the Colorado River in greater numbers than all other duck species com-



bined. A few Gadwalls, however, occur on coastal brackish pools and estuaries.

With rapid wing-strokes, migrants fly swiftly and directly in small tight groups. On takeoff, individuals spring easily into the air with a low whistling of their wings. The Gadwall dabbles and tips up at shore edge for buds, leaves, and roots of pondweeds and sedges, seeds of rushes and grasses, and algae; it also dives for food, perhaps more often than most other surface-feeding ducks. It walks with no difficulty on land and often ambles to fields to feed on wheat, barley, corn, and other waste grain, or into woods in search of acorns and other nuts. A very few worms, small mollusks and fish, and aquatic insects are consumed by the Gadwall, usually in summer.

The drake's vocalizations include a loud *kack kack*, a deep reedy *whack*, also a seldom heard shrill whistle. The female Gadwall sounds a loud series of *quack*'s that commences loud and high but descends in pitch and volume.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage (gray phase):* Acquired by partial postaestival molt. Forehead and cheeks buffy white or cartridge buff to dull cream buff, thickly spotted or streaked with fuscous black or chaetura black; crown and occiput light dull sepia, broadly barred with fuscous; postocular region chaetura black, finely marked with dull light gray and dull light brown; remainder of upper parts chaetura black, middle portion of lower back and rump chaetura drab, narrowly, irregularly, and numerous barred with dull white or buffy white; rump and upper tail-coverts black, slightly glossed with dull green or blue; tail hair brown, narrowly margined with pale buff or buffy white; primaries and secondaries between fuscous and hair brown, becoming hair brown basally; tertials dull hair brown; scapulars sayal brown terminally; remainder similar to back but washed with same color and numerous barred like back; lesser wing-coverts between hair brown and drab; most of median wing-coverts and some of lesser coverts chestnut, forming patch on anterior part of wing; speculum black with large central inner area of pure white; chin and throat pale buff or buffy white, finely spotted with hair brown to chaetura black; chin sometimes nearly immaculate; jugulum chaetura black with conspicuous white edgings of feathers, these producing scalelike appearance; sides similar to back but much more narrowly barred and vermiculated with hair brown and dull white or pale buffy white; lower breast and abdomen white; shorter lower tail-coverts white, irregularly vermiculated with hair brown; remainder of lower tail-coverts black; lining of wing white. Bill bluish black or slate gray, but cutting edges dull orange; iris reddish brown or dull dark brown; legs and feet dull orange or dull yellow, but webs dull brown. *Adult male, winter and nuptial (brown phase):* Acquired by partial postaestival molt. Similar to gray phase, but head and neck much more brownish (less grayish). *Adult male, eclipse:* Acquired by complete postnuptial molt. Upper parts brownish black, feathers margined with tawny; wings as in winter-nuptial adult male; breast dull ferruginous, spotted with darker; sides and flanks dark brown with some ferruginous margins; remainder of under surface dull white, feathers spotted centrally with blackish. Bill orange. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Upper parts chaetura drab to fuscous; crown almost unstreaked; rest of head and neck narrowly and numerous streaked with light buff to cinnamon; feathers of remaining upper parts conspicuously and irregularly barred and edged with light buff to cinnamon; tail dull hair brown mottled with buff and cinnamon; wing-quills dark hair brown; lesser coverts hair brown, broadly edged with white or buff; speculum dull gray-

ish white, black parts in male replaced by dark dull hair brown; lining of wing white; sides of head and of neck dull white, numerous streaked with fuscous and buff; center of chin unmarked; jugulum and sides cinnamon, spotted and streaked with fuscous, hair brown, and buffy brown; remainder of lower parts dull white; breast and abdomen spotted with dull brown and crissum streaked with fuscous and edged sparingly with cinnamon. Bill with broad clove brown stripe on culmen, the rest ochraceous or dull orange; iris dark brown; legs and feet tawny olive or dull yellow, webs of toes and claws clove brown. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but upper surface less conspicuously marked with buff; chin and throat buff; markings of sides and flanks more deeply buff. *Male, first nuptial:* Acquired by wear from first winter, with which it is practically identical. *Male, first winter:* Acquired by partial postjuvenile molt. Similar to adult male, but back and wings, except gray innermost secondaries, like same parts in juvenile, some feathers of breast and abdomen more or less marked with gray. *Female, first nuptial:* Acquired by wear from first winter, with which it is practically identical. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to adult female but retaining wings of juvenile; has less black and little or no chestnut in greater wing-coverts. *Male, juvenile:* Acquired by complete postnatal molt. Similar to adult female, but more rufescent on upper parts, jugulum, and sides; lower surface more heavily marked; feathers of back and scapulars less broadly edged with buff, sometimes barred; chestnut on median coverts less, sometimes wanting. Bill above chaetura black, but cutting edges and mandible orange rufous, nail russet; iris vandyke brown; legs and feet dull orange buff, but webs of toes black; claws isabella color. *Female, juvenile:* Acquired by complete postnatal molt. Similar to juvenile male, but with few bars on scapulars and mantle. Maxilla slate black, but cutting edges cinnamon or tawny olive; mandible bright tawny olive or cinnamon, nail cinnamon or ecru drab; iris prout brown; legs raw umber; toes tawny olive or dull naples yellow; claws drab or broccoli brown. *Natal:* Crown and upper parts clove brown, but posteriorly olive brown, neck and upper back buffy brown; sides of head dull buff; loreal and postocular streak clove brown; lower parts buffy white or pale buff; spot on each scapular region and on each side of rump of same color.

MEASUREMENTS: *Adult male:* Wing, 252.0–273.0 (average, 262.9) mm.; tail, 75.9–91.9 (85.3); bill (exposed culmen), 41.4–45.0 (43.2); height of bill at base, 16.0–18.0 (16.8); tarsus, 39.1–43.9 (41.7); middle toe without claw, 46.5–51.1 (48.5). *Adult female:* Wing, 242.1–257.0 (249.7); tail, 71.1–88.4 (80.2); bill, 37.1–42.9 (39.9); height of bill, 15.0–17.0 (15.7); tarsus, 39.1–42.4 (40.1); middle toe, 42.9–47.5 (44.4).

TEXAS: *Breeding:* No specimen in breeding condition (see species account). One summer specimen: Galveston Co., Galveston (June 2, 1864, H. E. Dresser). *Winter:* Taken north to Hemp-hill (Oct. 24), east to Archer, Marion (fall), and Chambers, south to Cameron, west to Brewster (Oct. 17) and Reeves (May 22) cos.

NESTING: *Nest:* In marshes or meadows, often on more or less rocky islands in lakes; usually on dry ground, in a hollow amid grass; composed of weeds and grass; lined with fine grass, feathers, and down. *Eggs:* 7–13, usually 10–12; elliptical oval or oval; dull cream white, cream buff, or clay color; unmarked; average size, 55.3 × 39.6 mm.

EUROPEAN WIDGEON, *Mareca penelope* (Linnaeus)

SPECIES ACCOUNT

Widgeon of Old World authors. Resembles the American Widgeon (see below). *Male:* told by burnished buff (not white) forehead and crown; lack of green patch back of eye; rich reddish brown (not grayish)

head, neck; grayish (not brownish) back, sides. *Female*: very difficult to separate in the field; in good light, note reddish (not grayish) head; in flight, sometimes the brownish axillars (white in *M. americana*) are visible. Length, 18½ in.; wingspan, 31½; weight, 1¾ lbs.

RANGE: N. Palaearctic from approximately lat. 73° N., south to Scotland, n. Poland, Kirghiz Steppes, Mongolia, and Kamchatka Peninsula. Winters chiefly from British Isles, s. Scandinavia, and s. Russia to Nigeria, Kenya, Saudi Arabia, Baluchistan, India, s. China, and Japan; rarely, but regularly, in North America (north of Mexico), chiefly on Pacific, Gulf, and Atlantic coasts, to a lesser extent inland in scattered localities.

TEXAS: (See map.) *Winter*: Oct. 23 to Apr. 24. Extremely rare (at least 21 records) and irregular, chiefly in Dallas-Fort Worth area and on coast (see detailed account), though has occurred in Travis, Midland, Deaf Smith, and Hutchinson cos.

HAUNTS AND HABITS: The European Widgeon breeds chiefly in the boreal zone of the Old World. Prime haunts are about freshwater pools in coniferous forests, also in moorland and scrub tundra. The nest, lined with grass and down, is on the ground and usually well hidden in grass or heather; it is normally near (10 to 20 yards), but sometimes far from, water. The species is somewhat more maritime during the nonbreeding season than is its New World cousin, the American Widgeon. During winter *Mareca penelope* mostly seeks coastal mud flats and estuaries, although a number also occur on large inland lakes and reservoirs. In North America, it is a regular straggler. Individuals appear most frequently on the Atlantic seaboard, especially in fall and winter; lesser numbers turn up in the

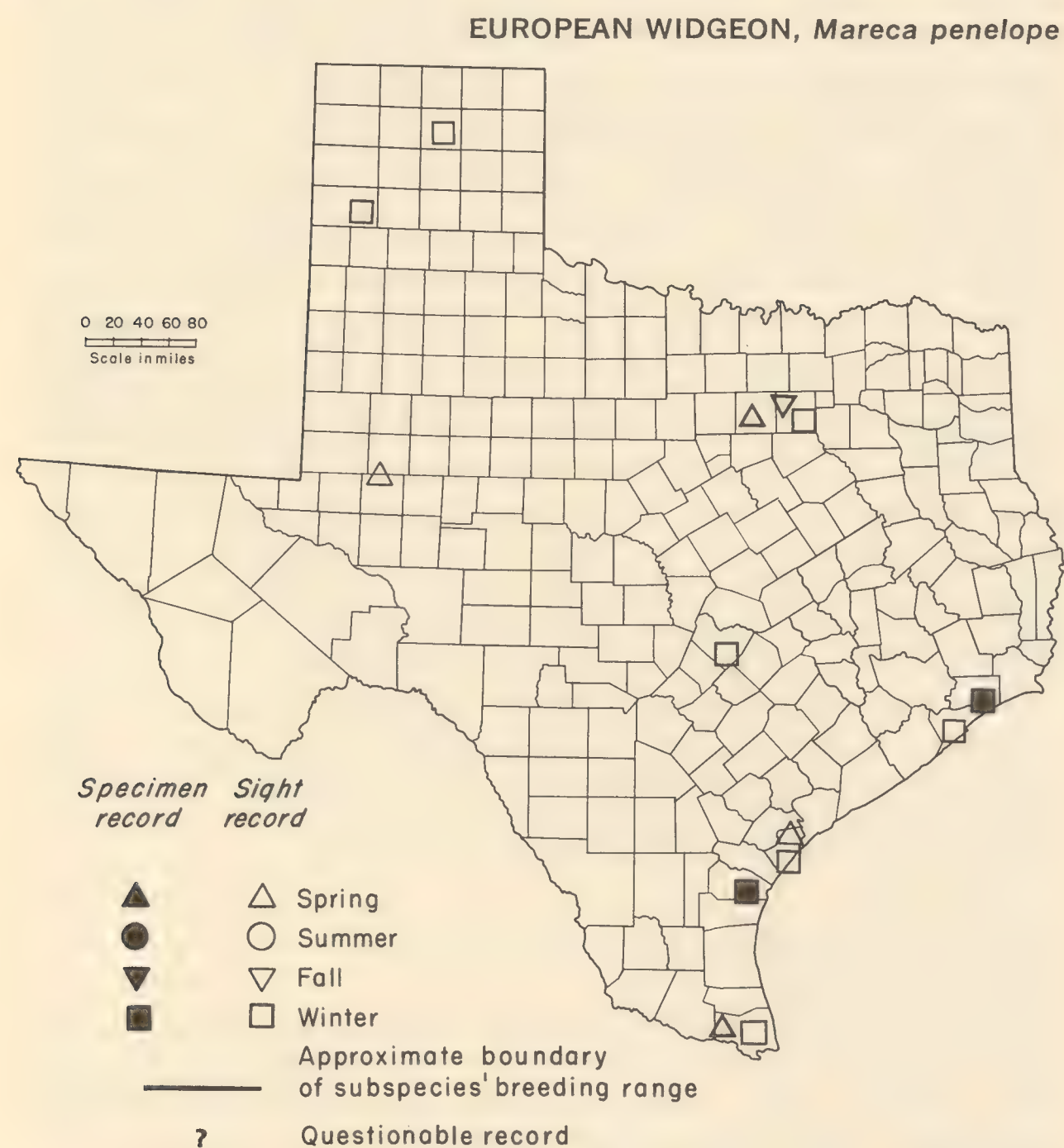
Mississippi Valley, usually in spring, and on the Pacific coast, mostly in winter. On its home range, the European Widgeon is quite gregarious; New World vagrants usually join ranks with the American Widgeon.

Flight and behavior are very similar to its American counterpart. Due to hunting persecution, this species, like the Mallard and American Widgeon, has become largely a night feeder. Often, especially in spring, it grazes goose fashion on grassy banks. Aquatic food includes pondweeds, widgeongrass, sedges, and eelgrass (*Zostera*). This last item is often acquired by following brant or large ducks which dive for the plant but eat only the roots; the floating fronds that remain are readily devoured by the European Widgeon.

The drake's whistle is a wild melodious *whee-oo*, which varies to *wheeye-irrr* when he is angry; if frightened, he sounds a sparrowlike chirp or cheep note. The female utters a throaty growl and, when alarmed, a harsh *quack*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial*: Acquired by partial postaestival molt. Forehead and center of crown light buff or cream buff; rest of head and neck tawny or russet, more or less speckled with fuscous or metallic dark olive green, sometimes almost immaculate; chin and middle of throat fuscous or fuscous black, more or less mottled with russet; lower hindneck, back, and scapulars chaetura drab or dull black, vermiculated or very finely barred with white; rump chaetura drab with very fine vermiculations of dull white; exposed surface of upper tail-coverts white with some vermiculations of drab or hair brown; lateral coverts glossy greenish black and the longest with outer webs dull black or fuscous black; tail hair brown, central feathers chaetura drab or chaetura black, narrowly margined with dull white or buffy white; primaries fuscous, inner webs lighter, anterior lesser coverts mouse gray with very fine obscure vermiculations of white or paler gray; most of remaining wing-coverts white, greater series with broad black tips except on innermost; speculum metallic grass green, terminally black; innermost secondaries white on upper web; tertials black on outer web with broad white edge sometimes vermiculated with drab or hair brown; jugulum cinnamon drab or army brown; crissum black or fuscous black, slightly glossy; remainder of lower parts white; sides and flanks vermiculated with chaetura black or light hair brown; lining of wing drab or light drab, vermiculated with dull white; axillars white, much vermiculated or obscurely barred with drab or light drab. Bill light grayish blue or plumbeous, but tip, including nail and mandible, black; iris vandyke brown; legs and feet light grayish blue or slaty olive, webs of toes black; claws chaetura black. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female, but most of wing-coverts white; pileum usually marked with larger and fewer spots. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Similar to adult female American Widgeon, *Mareca americana*, but head, neck, and sometimes sides of body more deeply tinged with cinnamon buff or pale ochraceous, axillars barred or mottled with drab or light hair brown. Bill dark plumbeous, but tip black; iris reddish brown; feet plumbeous or yellowish brown, but webs of toes dull brown. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but back and scapulars commonly without buff or cinnamon buff bars, instead with broad cinnamon margins. *Male, first nuptial*: Acquired by wear from first winter, with which it is practically identical. *Male, first winter*: Acquired by partial postjuvinal molt. Like winter-nuptial adult male, but distinguished by retention of body and tail feathers and upper wing-coverts of juvenal. *Female, first nuptial*: Acquired by wear from first winter and resembling adult female in eclipse, except



for retention of body and tail feathers and median and lesser wing-coverts of juvenal. *Female, first winter*: Acquired by partial postjuvinal molt. Like first nuptial. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but feathers of flanks and sides of rump usually more or less finely vermiculated; neck, head, sides, and flanks more tawny; greater wing-coverts without broad pure white tips and with more well defined subterminal black bars; median and some lesser coverts with more white or pale gray; speculum usually brighter. *Female, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but mantle very slightly or not at all barred; upper wing-coverts duller, as is speculum which is sometimes much speckled with gray.

MEASUREMENTS: *Adult male*: Wing, 248.9–265.9 (average, 255.8) mm.; tail, 86.6–108.0 (97.3); bill (exposed culmen), 33.0–37.6 (34.5); height of bill at base, 15.5–18.0 (16.5); tarsus, 39.1–39.9 (39.6); middle toe without claw, 40.9–45.0 (42.9). *Adult female*: Wing, 227.1–245.1 (238.5); tail, 79.0–93.0 (88.1); bill, 32.5–35.1 (33.8); height of bill, 14.5–17.0 (15.7); tarsus, 35.1–38.6 (37.3); middle toe, 39.9–42.9 (41.1).

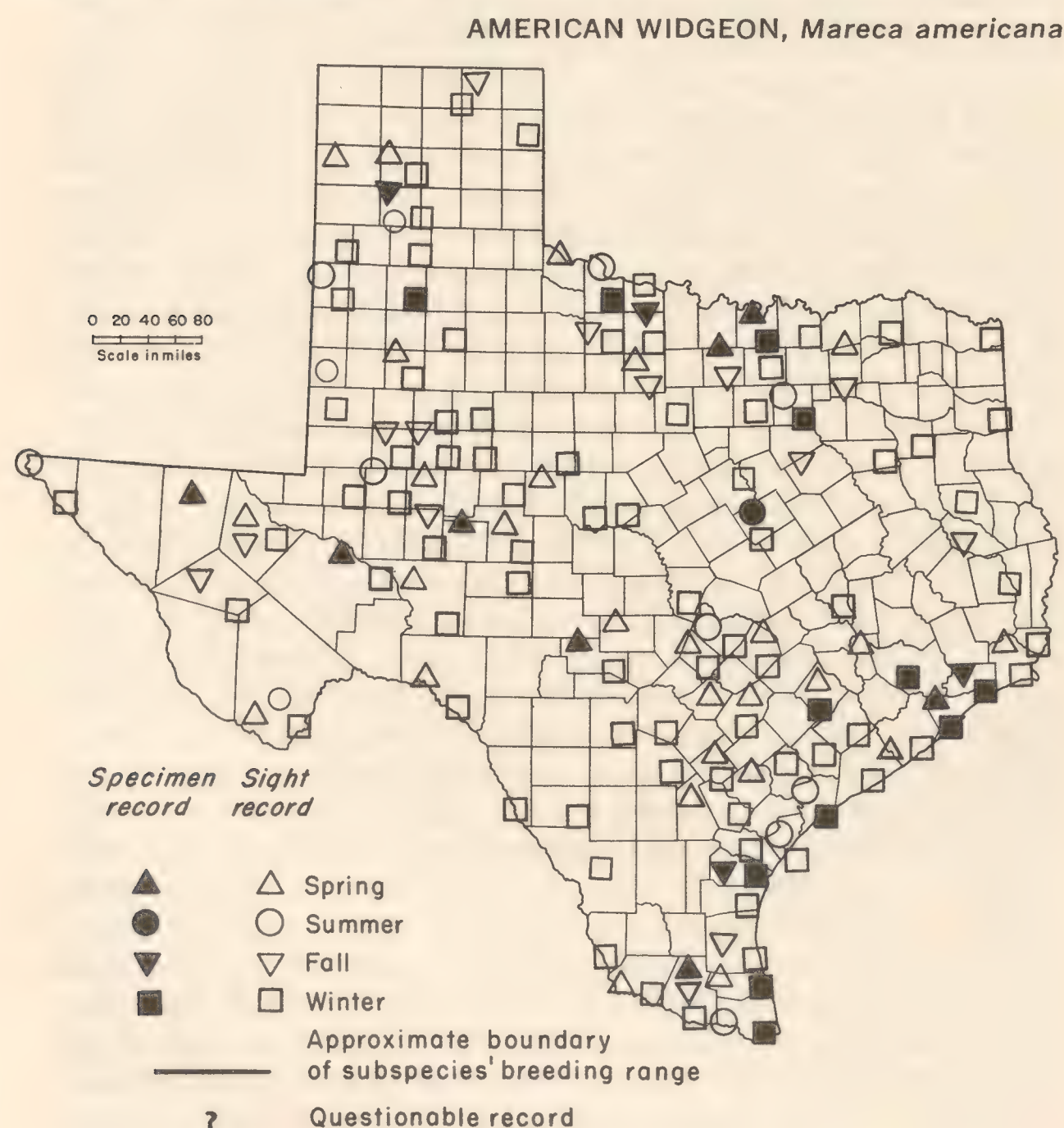
TEXAS: *Winter*: One specimen: Nueces Co., Corpus Christi (Dec. 20, 1921, S. T. Bixby). Bird shot (specimen?) in Chambers Co., Cove (Dec., 1937, identified by A. K. McKay).

AMERICAN WIDGEON, *Mareca americana* (Gmelin)

SPECIES ACCOUNT

See colorplate 2

Baldpate of older authors. A medium-sized pond duck with short black-tipped blue-gray bill; blue-gray legs. In flight, shows (above) a large white patch (grayish in female) on forepart of inner wing and a green speculum. *Male*: white forehead and crown; broad dark glossy green streak behind eye; grayish on rest of head, neck; brownish back, sides; magenta brown chest; white breast, belly, flanks; black crissum. *Female*: grayish head, neck; otherwise brownish above, on chest, sides, crissum; white breast, belly. Length, 19¼ in.; wingspan, 33; weight, 1¾ lbs.



RANGE: N.w. Alaska, n.w. Mackenzie, and Manitoba, south locally and sparingly (east of Cascades) to n.e. California, Nevada, New Mexico, Colorado, n.w. Nebraska, and Michigan. Winters chiefly from s. British Columbia, Colorado, Kansas, Gulf states, and Pennsylvania through Mexico (including Baja California) to Costa Rica, irregularly to Panama and Colombia.

TEXAS: (See map.) *Winter*: Early Oct. to mid-May (extremes: Sept. 6, June 1). Locally abundant to uncommon throughout. Rare—formerly uncommon to scarce—summer lingerer, especially in northwest portion.

HAUNTS AND HABITS: From Alaska south across the Canadian and midwestern U.S. prairies, the American Widgeon, or Baldpate, nests on islands in lakes, or in open grasslands or woods, near or far from water. A grass-, leaf-, and down-lined hollow for the standard ten-egg clutch is made in dry ground and is often carelessly concealed. Early in autumn, birds move leisurely to their winter retreats. They return to breeding grounds toward the end of spring, most individuals crossing into Canada in late May. During cold months, besides haunting freshwater ponds and lakes, they also occur in brackish marshes and bays, often in association with Mallards, Pintails, and Gadwalls, as well as various diving ducks.

The American Widgeon is an alert and nervous duck; often when disturbed, to the hunter's dismay, it sounds rather startling alarms which arouse other ducks in the vicinity. It is swift on the wing and flies in small, compact, irregular parties with much twisting and turning. When taking off, it rises vertically on rattling wings like other pond ducks. *Mareca americana* floats high with its tail well clear of the water. Except for a few snails, its diet is vegetable: chiefly leaves, stems, and buds (less frequently seeds) of pondweeds—especially widgeongrass (*Ruppia maritima*)—grasses, smartweeds, and waterlilies, also algae. It particularly favors wildcelery, which grows deep, and is a chief food of diving ducks. Since this puddle duck is no diver, it resorts to snatching bits of *Vallisneria* from the bills of Canvasbacks, Redheads, and other bay species as they emerge from a foraging plunge. Gooselike, it also grazes on banks and in fields for grass and grain. It dabbles and tips up in shallows somewhat less than most other pond ducks. The American Widgeon, especially in areas of heavy hunting, has become largely a night feeder; during the day it rests either amid shoreline vegetation or in rafts in open water a safe distance from the bank.

The whistling cry of the drake, uttered on the wing or in the water, is a *whew whew whew*, given in series of three; it is heard year-round. The female sounds a *qua-awk qua-awk* and a loud *kaow kaow*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Forehead and center of crown creamy white; broad band on each side of head above and behind eyes reaching back to center of occiput and down

hindneck metallic dark green; mantle hair brown to chaetura drab, washed with brownish drab; rump and lower back chaetura drab or dark hair brown; longest upper tail-coverts glossy black, edged on anterior webs with pale buff; remaining upper tail-coverts hair brown, vermiculated with dull white; tail hair brown, middle feathers chaetura drab; wing-quills fuscous, inner webs drab; lesser wing-coverts and edge of wing dull hair brown, remainder of lesser wing-coverts and median and basal portion of greater coverts white, inner feathers hair brown; speculum metallic bronzy olive green anteriorly, the inner portion smoke gray, the posterior part deep black, and the whole bordered anteriorly by black; outer webs of tertials black, narrowly margined with white and hair brown, inner webs terminally dull hair brown; sides of head and of neck, chin, and upper throat light buff, thickly spotted with chaetura drab or chaetura black; jugulum and sides brownish drab; lining of wing smoke gray vermiculated with white or very pale gray; axillars plain white; breast, abdomen, and flanks white; lower tail-coverts glossy black. Maxilla plumbeous, lilac gray, or light grayish blue, tip and mandible black, but base of mandible dark gull gray; iris prout brown; legs and feet grayish blue, olive gray, or olive, but webs of toes dull black and claws slate black. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but sides brighter; wing as in winter-nuptial adult male. *Adult female, winter and nuptial*: Acquired by partial postestival molt. Crown and rump chaetura drab, former streaked or mottled with very pale buff or dull white, least so on occiput and most obscurely on hindneck; mantle light fuscous; feathers edged with dull hair brown and narrowly barred or vermiculated with cinnamon and dark ochraceous tawny; upper tail-coverts similar, but bars white or very pale buff; tail dark hair brown, narrowly edged with dull white and slightly mottled exteriorly with dull buff or pale cinnamon; primaries and secondaries fuscous, inner webs between drab and wood brown; bend of wing hair brown; speculum similar to that of adult male but duller, metallic green of less extent; white area on wing-coverts similar and somewhat clouded with gray; sides of head and of neck, chin, and upper throat dull white or slightly tinged with buff, thickly spotted or narrowly streaked with chaetura drab or chaetura black; jugulum wood brown and breast cinnamon drab, both more or less spotted with fuscous; sides and flanks wood brown tinged with cinnamon drab and edged with paler; abdomen and lower tail-coverts white, the latter barred and spotted with cinnamon drab and fuscous; lining of wing and axillars mostly white, edge of wing more or less mottled with drab. Bill bluish gray or plumbeous, but base and tip of maxilla, with mandible, black, the nail of mandible dark drab; iris mummy brown; legs and feet olive gray, webs of toes slate black; claws brownish black. *Adult female, eclipse*: Acquired by complete postnuptial molt. Like winter-nuptial adult female. *Male, first nuptial*: Acquired by wear from first winter. Similar to adult male, except for presence of retained juvenal upper wing-coverts. *Male, first winter*: Acquired by partial postjuvenal molt. Like first nuptial male, but maxilla french gray, tip black; mandible slate black mottled with ecru drab; iris vandyke brown; legs and feet olive gray, but webs of toes slate; claws chaetura black. *Female, first nuptial*: Acquired by wear from first winter. Similar to adult female, but distinguished by retained juvenal wings. *Female, first winter*: Acquired by partial postjuvenal molt. Similar to first nuptial. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but mantle less distinctly barred; lesser wing-coverts tipped and spotted with white or very pale buff; sides and flanks more pinkish brown; tail feathers less sharply pointed. *Female, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but mantle not distinctly barred; median coverts and posterior lesser coverts with less white, edgings of greater coverts hair brown or drab with less clearly defined black tips; speculum duller, sometimes vermiculated externally with pale gray. Maxilla slate black, nail seal brown; mandible fawn but plumbeous at base; iris vandyke brown; legs, joints and webs of toes olive black; rest of toes pale olive buff.

MEASUREMENTS: *Adult male*: Wing, 245.1–265.9 (average,

256.0) mm.; tail, 103.1–131.0 (113.3); bill (exposed culmen), 33.0–38.1 (35.3); height of bill at base, 14.5–17.5 (16.5); tarsus, 38.1–40.9 (39.6); middle toe without claw, 39.9–48.0 (45.2). *Adult female*: Wing, 230.1–252.0 (239.8); tail, 86.1–101.1 (93.2); bill, 31.5–37.8 (34.8); height of bill, 14.0–16.5 (15.5); tarsus, 36.1–40.4 (37.3); middle toe, 39.9–46.0 (42.7).

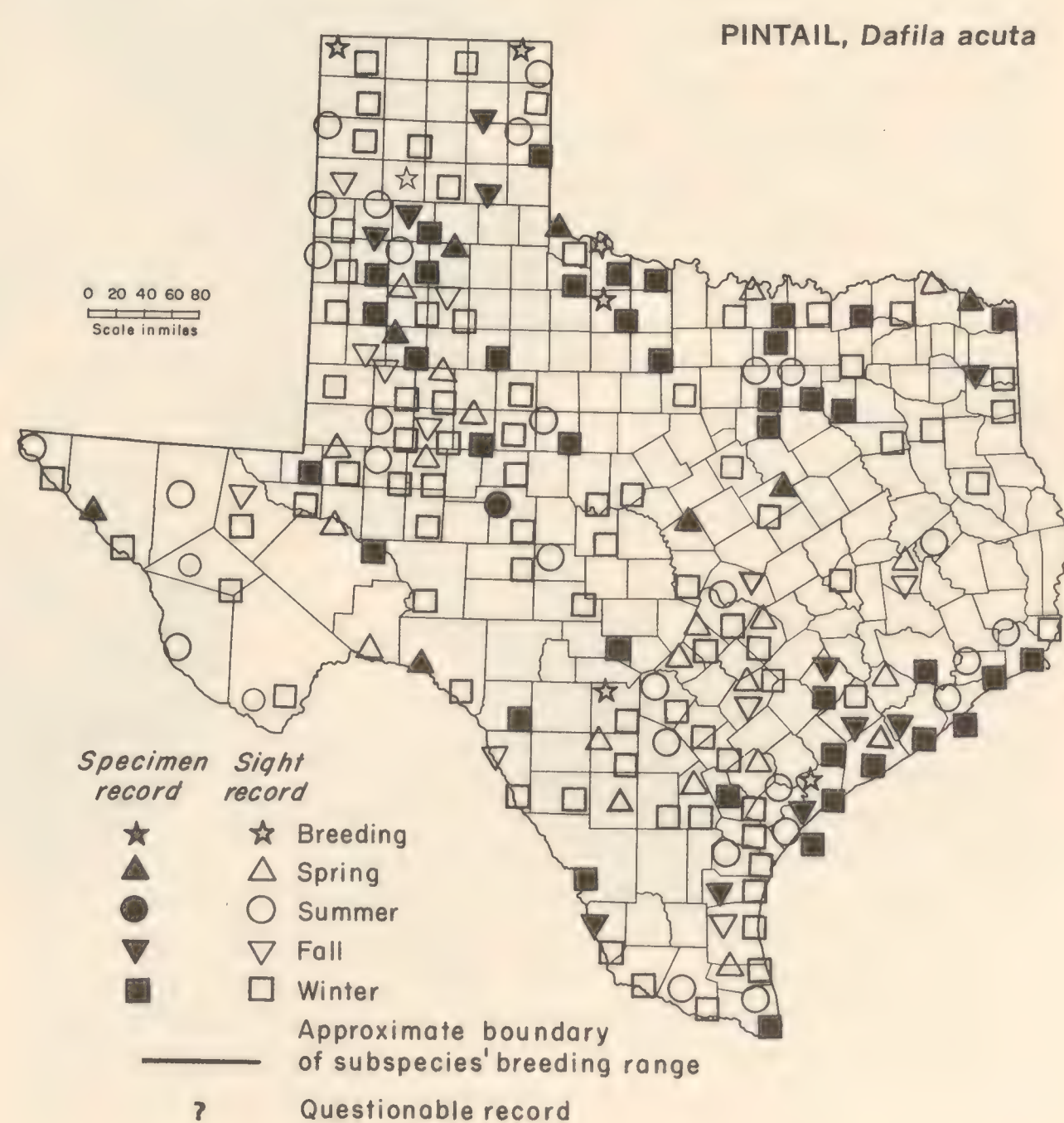
TEXAS: *Winter*: Taken north to Randall (Nov. 3), east to Cooke and Chambers, south to Cameron, west to Pecos (May 31) and Culberson (Mar. 24) cos.

PINTAIL, *Dafila acuta* (Linnaeus)

SPECIES ACCOUNT

Anas acuta of A.O.U. check-list, 1957 (see Appendix A). A large duck with a long slender neck; blue-black bill; in flight, shows narrow white border on rear edge of bronzy green speculum. *Male*: dark brown head broken by white vertical prong on each side of hind-head, this contiguous with white foreneck, chest, breast, belly, and flanks; grayish hindneck, back, sides; black crissum; long, needlelike black plume projecting from whitish tail. *Female*: brown and buff mottled upper parts (darkest on crown and back), chest, and sides; buffy chin, throat, and remaining under parts; tail decidedly pointed but lacks elongated plume. Length, 26 in. (male), 21½ (female); wingspan, 36 (male), 33½ (female); weight, 2 lbs. (male), 1¾ (female).

RANGE: Holarctic between approximately lat. 75° N. and lat. 35° N.; in North America, from Alaska, n. Keewatin, and n. Quebec, south locally to c. California, n. Arizona, Colorado, Texas (at least formerly), and Nebraska, sparingly to Michigan, n. Ohio, n.w. Pennsylvania, and Massachusetts. Winters mainly between lat. 60° N. and the Equator; in Western Hemisphere, from s.e. Alaska, n. California, Colorado, s. Illinois, and



Chesapeake Bay through Mexico and Central America to Panama and Colombia; also Hawaiian Islands and West Indies.

TEXAS: (See map.) *Breeding*: Seven records: Dallam Co., Buffalo Springs (a few breeding, 1935, Mrs. R. L. Duke); Lipscomb Co., Booker (young found, July 31, 1924, G. M. Riddick); Randall Co. (reported, but no specific data); Wilbarger Co. (downy young found, May-June, 1928, R. L. More); Baylor Co., Lake Kemp (nest and 9 eggs, June 12, 1939, More); Medina Co., Chacon Lake (5 large young unable to fly, July 11, 1930, A. J. Kirn); Calhoun Co., Matagorda Island (young seen, summer 1931, S. F. Taylor). Rare—formerly uncommon to rare—nonbreeding summer lingerer throughout, especially in northwest portion and coastal regions. *Winter*: Mid-Aug. to late May (extremes: Aug. 14, June 8). Locally abundant to uncommon throughout.

HAUNTS AND HABITS: The trim elegant Pintail is widely distributed across North America and Eurasia. Predictably, it is found in puddle duck habitat—shallow lakes and ponds. In early fall, it starts south about the same time as, or just after, the Blue-winged Teal. On winter wetlands it occurs in fresh water, but also feeds in brackish marshes and rafts with its fellows during the day on salt bays. Apparently more hardy in spring, Pintails—which would not linger in the autumn cold—push back to the breeding grounds behind the first thaws; frequently females are laying eggs by May.

The Pintail is a strong, swift (up to 65 m.p.h.), and graceful flier. With no difficulty it springs vertically from water to air like a Mallard or teal. Pintails generally fly in small straggling companies; when descending, groups zigzag down in rapid flight, wings making loud rushing noises. This buoyant swimmer rides high in the water with head and neck alertly raised and pointed tail needling up at an angle. Aided by its long neck, the Pintail is an efficient tip-up feeder. In shallows it gathers mainly seeds, also roots and shoots, of sedges, pondweeds, grasses, and smartweeds. Especially where water sometimes freezes, it forages on uplands for waste grain, acorns, insects and their larvae; however, it feeds on the land less than does the Mallard.

Dafila acuta is ordinarily silent. The male sometimes sounds a loud *qua qua* in flight, also mellow, low, teal-like whistles; in courting, he mews softly. The female hoarsely utters an infrequent muffled *quack*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Head all around, chin, and upper throat grayish sepia; hindneck anteriorly glossy greenish black but posteriorly, with upper back, hair brown, back and anterior scapulars finely barred with dull white; lower back dull fuscous and, with the rump, finely vermiculated with dull white, the latter medially streaked with blackish; longest upper tail coverts black, inner webs buffy white, remaining upper tail-coverts hair brown, mottled with pale buff and streaked medially with chaetura drab; tail hair brown, middle feathers fuscous black, others paler on inner webs, and edged on outer webs

with buffy white; primaries and secondaries fuscous, inner webs drab; tertials and longest scapulars black, margined with white or buffy white, outer webs of outer tertials drab, and most of wing-coverts hair brown; speculum dull bronzy green, margined anteriorly with dull cinnamon buff, posteriorly with black, and then broadly with white formed by tips of secondaries; sides like back; breast, jugulum, and lower throat white with a narrow white prong extending up side of neck to hind-head; abdomen drab gray or light drab, vermiculated with white; lower tail-coverts black, outer feathers broadly margined with white; lining of wing light drab, inner posterior coverts mottled with white; axillars white, mottled with light drab. Bill black, broad edges of maxilla bluish gray or cinereous verging to lavender gray at base; iris vandyke brown; legs and feet olive gray, but webs of toes and claws slate color or black. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female but darker above and without broad pale buffy edges of feathers; back with very narrow white bars and comparatively little whitish vermiculation; sides of breast conspicuously but narrowly, also sides and flanks more broadly, barred with white; wing similar to that of winter-nuptial adult male. Bill with less conspicuous gray edges on maxilla. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Top of head wood brown, narrowly streaked with fuscous; hindneck tilleul buff, finely streaked and mottled with chaetura drab; upper back grayish hair brown; remainder of upper parts fuscous or fuscous black, irregularly barred and spotted with dull white, buff, and cinnamon, this most conspicuous on rump and mantle; tail dark hair brown, irregularly marked or imperfectly barred with pale buff or dull white, rectrices narrowly edged with buffy white; wing-quills fuscous, inner webs drab; wing-coverts dull hair brown, margined with white; speculum mostly grayish buff, mottled with darker buff, anteriorly narrowly bordered by white, posteriorly by dull black bar and white bar; sides of head and of neck, with lower throat, wood brown, spotted and narrowly streaked with fuscous; chin and center of upper throat pale buff; lower parts dull buffy white, more suffused with cinnamon buff on breast and obscurely spotted there and elsewhere with hair brown, fuscous, and drab; lower tail-coverts buffy white, broadly streaked with hair brown; lining of wing and axillars dull hair brown, coverts edged and axillars irregularly barred and mottled with dull hair brown. Bill above olive black, below olive gray; iris prout brown; legs and feet olive gray, but webs of toes smoke gray; claws black. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but feathers of upper parts, with tail feathers, more broadly edged and barred with buff, innermost secondaries more broadly edged and streaked with buff or pinkish cinnamon. *Male, first nuptial*: Acquired by wear from first winter male. Similar to adult male, but middle tail feathers shorter; upper wing-coverts and some feathers of back and rump retained from juvenal. Bill black, with broad stripe of cinereous, and nail of mandible drab gray; legs and feet olive gray; claws seal brown. *Male, first winter*: Acquired by partial postjuvinal molt. Like first nuptial male. *Female, first nuptial*: Acquired by wear from first winter female. Very similar to adult female, but feathers of upper parts and innermost secondaries more narrowly marked with pale buff. *Female, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but upper surface less heavily barred and streaked; lower parts more conspicuously spotted or streaked. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male, but wing practically same as that of adult female. Maxilla drab, nail raw umber tipped with white; mandible yellowish ecru drab; iris broccoli brown; legs and feet olive to clove brown, but sides of toes dull yellow; claws pale fawn color. *Natal*: Upper parts brown, palest on back and forehead; chin, neck, lower part of cheeks, and stripe over eye white; postocular stripe and auriculars light brown; patch on wing and under surface of body white, latter more or less brownish.

MEASUREMENTS: *Adult male*: Wing, 246.1–275.1 (average, 264.2) mm.; tail, 184.2–241.3 (212.9); bill (exposed culmen), 47.0–56.4 (51.3); height of bill at base, 19.0–21.6 (20.1); tar-



PLATE 4: Cooper's Hawk, *Accipiter cooperii*
adult male (top) with prey, Eastern Meadowlark, *Sturnella magna*; immature female (bottom)

sus, 39.9–48.5 (43.7); middle toe without claw, 47.0–53.1 (50.3). *Adult female*: Wing, 245.1–253.0 (248.2); tail, 114.3–127.0 (120.6); bill, 43.9–51.6 (48.8); height of bill, 17.0–20.1 (18.5); tarsus, 39.9–43.4 (42.2); middle toe, 47.0–50.0 (48.3).

TEXAS: *Breeding*: No specimen in breeding condition (see species account). One summer specimen: Tom Green Co., near San Angelo (female, June, 1881, W. Lloyd). *Winter*: Taken north to Roberts (Oct. 21) and Wheeler, east to Bowie and Jefferson, south to Cameron, west to Pecos and Hudspeth (Mar. 19) cos.

NESTING: *Nest*: On prairies, open pastureland, or islands; usually on dry ground, sometimes in marsh, but often far from water; on ground, under bush or grassy tussock; in slight hollow in ground, composed of weeds; lined with grass, straw, weeds, rushes, and down. *Eggs*: 5–12, usually 7–9, elongate ovate, elliptical oval, or elliptical ovate; dull grayish olive, pale olive green, or pale olive buff, unmarked; average size, 54.8 × 38.4 mm.

[COMMON TEAL, *Nettion crecca* (Linnaeus)]

Anas crecca of A.O.U. check-list, 1957. Teal, European Teal, or Eurasian Teal of various authors. Closely resembles the Green-winged Teal (see below). *Male*: lacks white vertical stroke on side of breast, has instead a long white horizontal stripe on scapulars; usually shows a more distinct buff outline of his green head patch. *Female*: indistinguishable from female Greenwing. Length, 14 in.; wingspan, 23; weight, 12 oz.

RANGE: Iceland and n. Eurasia, south to s. France, Romania, s. Russia, Kirghiz Steppes, Manchuria, Sakhalin, n. Japan, Kurile Islands, and Aleutians. Winters south to Mediterranean region, Nigeria, Kenya, Iraq, Baluchistan, India, Formosa, and Philippines; very rare, but regular, in scattered localities in Canada and United States.

TEXAS: *Hypothetical*: Three sightings, all of single birds: Harris Co., La Porte (Feb. 5, 1967, Linda Snyder); Chambers Co., Cove (Mar. 2, 1967, A. K. McKay); Travis Co., Austin (male with 2 male Green-winged Teals, Nov. 20, 1967, David and Winifred Simon).]

GREEN-WINGED TEAL, *Nettion carolinense* (Gmelin)

SPECIES ACCOUNT

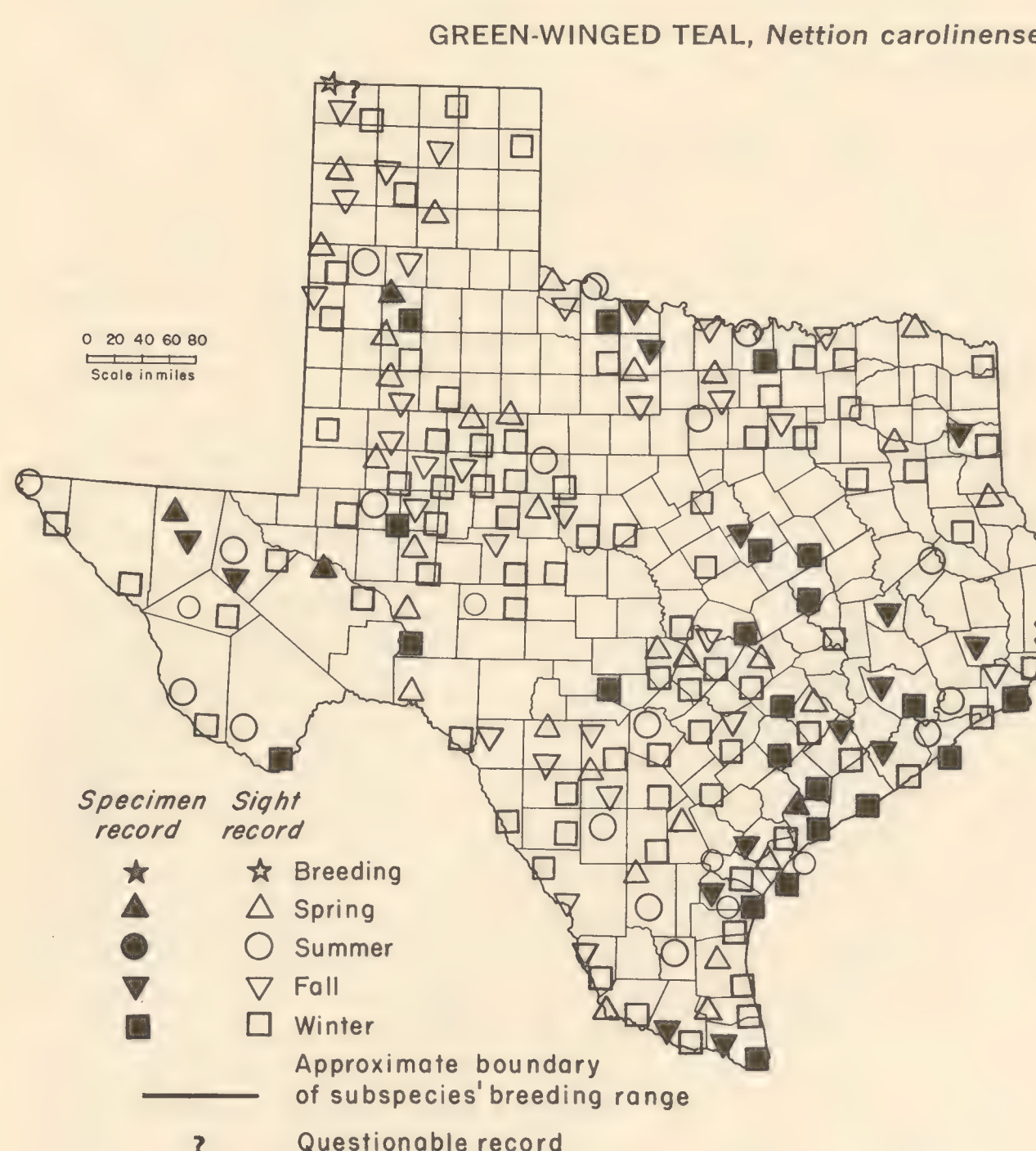
Anas carolinensis of A.O.U. check-list, 1957 (see Appendix A). Considered conspecific with Common Teal by some authors. A tiny pond duck with small blackish bill; grayish legs; in flight, reveals brownish upperwing with small green speculum. *Male*: dark cinnamon head and slight crest (cropped off at nape); broad glossy green streak around and behind eye, finely outlined with buff; grayish back and sides; vertical white stroke on side in front of wing; black-spotted buffy chest; whitish breast and belly; golden buff patch on each side of blackish crissum. *Female*: mottled buff and brown upper parts (darkest on crown and back), chest, and sides; blackish line through eye; whitish breast,

belly. Length, 14½ in.; wingspan, 23½; weight, 12¼ oz.

RANGE: N. central Alaska, n.w. Mackenzie, n. Manitoba, and s. Ontario, south sparingly (east of Cascades) to n. California, Utah, n. Colorado, n. Nebraska, Illinois, n.w. Wisconsin, and s.e. Pennsylvania, rarely and locally to Arizona and New Mexico. Winters chiefly from s. British Columbia, s. Utah, Texas, Gulf states, Florida, and Virginia to Baja California, Michoacán, State of México, Tabasco, British Honduras, and Honduras; also West Indies (rarely).

TEXAS: (See map.) *Summer* (perhaps bred formerly): Reported in Dallam Co., Buffalo Springs (a number nesting, July, 1936, Mrs. R. L. Duke), but details lacking and record questionable. Formerly rare and local in summer in western half, especially in Trans-Pecos. May still occur casually in western third in summer, but definite records since 1939 lacking. One recent record from San Patricio Co., Welder Wildlife Refuge (1 male seen, July 4, 1969, G. W. Blacklock). *Winter*: Late Aug. to mid-May (extremes: Aug. 7, June 1). Locally abundant to uncommon throughout.

HAUNTS AND HABITS: Smallest of the North American surface-feeding ducks, the Green-winged Teal is nonetheless a hardy species which breeds as far north as the Arctic Circle. It is a late and leisurely fall migrant and may linger on the breeding grounds until bitter winter storms have set in. Unlike their warmth-seeking relatives, the Blue-winged Teals, some Greenwings winter in southwestern Canada wherever they can find open water. By February, birds on the chief winter areas in the southern United States and Mexico press north to nest. At all seasons, Greenwing haunts are freshwater sloughs, marshes, ponds, and reservoirs; in winter a few appear on brackish coastal estuaries.



On the wing, because it is small and able to take off fast, it appears extremely swift. Actually its cruising speed of 30 m.p.h. and pressed speed of 40 m.p.h. are only about average for ducks. Birds move in large compact flocks which frequently perform marvelous sand-piperlike twisting and wheeling evolutions. In the water, the Greenwing usually tips up to sieve mud bottoms or snatch aquatic plants; in this respect it is a more orthodox puddle duck than the Blue-winged and Cinnamon teals and the Shoveler, which tip up only occasionally. This duck also maneuvers easily on land, where it walks about and even runs. Often it wanders far into woods to hunt for acorns, other nuts, and wild fruits and berries. It also feeds in rice fields, formerly more so than now. Food, typical of a pond duck's diet, is largely seeds, leaves, and stems of pondweeds, grasses, smartweeds, and duckweeds; also algae. A very few insects and mollusks are eaten. Individuals in the Pacific Northwest sometimes feast on spent salmon.

The male Green-winged Teal whistles a short mellow twitter; he also sounds a high-pitched, short, staccato whistle, sometimes joined by a low-pitched trill. His courtship vocalization is a vaguely musical *pheep*, *pheep*. Females utter a weak *quack*; when alarmed a *kup-kup-kup*; also *ek-ek-ek* when curious.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Crown auburn, occiput sandford brown; hindneck and back chaetura drab or chaetura black, finely barred or vermiculated with white or pale gray; lower back and rump fuscous, broad tips of feathers dull hair brown; shorter upper tail-coverts of same color, vermiculated with dull white; longer upper tail-coverts laterally glossy black, edged on inner webs with pale buff; middle feathers like those of rump; wing-quills between hair brown and fuscous; lesser wing-coverts hair brown; scapulars like back but more tinged with brown, and outer feathers margined exteriorly with velvety black as is innermost tertial; speculum metallic emerald green, inner portion velvety black, exteriorly bordered in front by band of dull tawny to buffy white and posteriorly by narrow bar of buffy white; broad oval patch on side of head metallic dark green, connecting with glossy black patch on back of neck; chin fuscous black; remainder of sides of head and upper throat chestnut; below the chestnut, a jugular collar of hair brown finely vermiculated with dull white; sides of breast and of body vermiculated like back but more clearly gray and interrupted by broad white bar on sides of breast; remainder of jugulum, with breast and abdomen, dull white or buffy white, shaded on breast with pale gray, and jugulum with numerous roundish spots of dull black; middle lower tail-coverts velvety black, lateral feathers cinnamon buff; lining of wing partly hair brown, outwardly mottled with white; remaining under wing-coverts and axillars white, the latter sometimes slightly mottled with gray. Bill black or dark blue; iris dark brown; legs and feet dull dark blue, light slate, gray, or olive green, webs of toes brownish black. *Adult male, eclipse:* Acquired by complete postnuptial molt. Like adult female, but with fewer light markings on upper surface and with some of scapulars vermiculated with gray; breast with some blackish spots. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Upper parts chaetura black or fuscous black; feathers of head and neck very narrowly edged or streaked with pale buff or buffy white; remaining upper parts broadly edged with same or with dull ochraceous; tail hair brown or fuscous, more or less mottled with pale buff, and rectrices edged with dull white; wings dull hair brown, inner webs of primaries drab; speculum like male's but duller; tertials

and scapulars like back; lining of wing including axillars white and outer margin more or less mottled with fuscous and dull hair brown; sides of head and neck dull white or buffy white, spotted or narrowly streaked with fuscous; chin and upper throat plain buffy white; lower throat like sides of head; jugulum fuscous, edges of feathers cinnamon buff or light buffy; sides of body similar; breast and abdomen dull white or buffy white, more or less spotted with dull hair brown, drab, or fuscous; lower tail-coverts buffy white, feathers with fuscous centers and sometimes cinnamon or pale buff edges. Maxilla brownish black or slate black, but base slate gray; mandible and bare space on chin ecru drab, mandible blackish toward tip; iris raw umber; legs and feet olive gray or light flesh color, but webs of toes and claws mouse gray. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but dark markings of jugulum commonly more veiled by buff feather tips; abdomen more conspicuously spotted with dark brown. *Male, first nuptial:* Acquired by wear from first winter male. Practically identical with adult male. *Male, first winter:* Acquired by partial postjuvenile molt. Like first nuptial male. *Female, first nuptial:* Acquired by wear from first winter female. Practically identical with adult female. *Female, first winter:* Acquired by partial postjuvenile molt. Not to be distinguished from first nuptial female. *Male, juvenal:* Acquired by complete postnatal molt. Similar to adult female, but tail feathers not so sharply pointed; lower parts paler, with more dark spotting on abdomen. *Female, juvenal:* Acquired by complete postnatal molt. Similar to juvenal male, but wings somewhat duller, and abdomen less heavily marked with dark brown or black. *Natal:* Upper parts olive brown, darkest on top of head; light buff spot on hind part of each wing, another on each side of back, and one on each side of rump; sides of head and neck dull clay color, olive brown stripe through eye, and another from lores to auriculars; chin and throat chamois; breast and abdomen light buff or dull buffy white.

MEASUREMENTS: *Adult male:* Wing, 172.0–188.0 (average, 182.3) mm.; tail, 62.0–70.1 (66.3); bill (exposed culmen), 35.6–39.9 (36.8); height of bill at base, 13.5–15.5 (14.2); tarsus, 29.9–33.0 (31.8); middle toe without claw, 33.0–38.1 (35.3). *Adult female:* Wing, 165.1–180.1 (170.7); tail, 61.0–69.1 (64.3); bill, 32.0–37.1 (34.8); height of bill, 12.4–14.5 (13.2); tarsus, 28.9–32.0 (30.5); middle toe, 29.9–35.6 (33.8).

TEXAS: *Breeding* (perhaps formerly): See species account. *Winter:* Taken north to Hale and Wilbarger, east to Marion (Nov. 7) and Jefferson, south to Cameron, west to Brewster and El Paso (exact date unknown) cos.

NESTING: *Nest:* On edges of marshes or on high open land, often some distance from water; at edges of brushy weeds, on ground (often dry) amid grass or other vegetation; made of grass, weeds, and other vegetation, feathers, and down; lined with down, soft grass, weeds, and leaves. *Eggs:* 5–18, usually 10–12; ovate or elliptical ovate; pale greenish buff, pale dull buff, dull white, or cream color; unmarked; average size, 45.7 × 34.3 mm.

BLUE-WINGED TEAL, *Querquedula discors* (Linnaeus)

SPECIES ACCOUNT

Anas discors of A.O.U. check-list, 1957 (see Appendix A). A small dabbler with blackish bill; orangish or yellowish legs; in flight, upperwing shows a large chalk blue patch on forepart of inner wing and a green speculum. *Male:* deep gray head with large white crescent on face in front of eye; mainly blackish above; black-spotted cinnamon below; white flank-patch; black crissum. *Female:* mottled buffy and brown upper parts (darkest on crown and back), on chest and sides; thin blackish line through eye; whitish chin, throat, and re-

maining under parts; not clearly told in field from female Cinnamon Teal (see below); best assessed by association with males. Length, $15\frac{3}{4}$ in.; wingspan, $24\frac{3}{4}$; weight, $13\frac{1}{2}$ oz.

RANGE: S.e. Alaska to s. Ontario and Newfoundland, south to n. central California, New Mexico, n. Missouri, Virginia, and New York, rarely and locally to s. California, Texas, Oklahoma, and Louisiana. Winters mainly from Texas, Tennessee, and North Carolina to the Equator.

TEXAS: (See map.) *Breeding:* Apr. to Aug. (eggs recorded, Apr. 29; young unable to fly, Apr. 19 to Aug. 23) from near sea level to 4,000 ft. Locally scarce to rare—formerly uncommon to rare—and irregular in eastern half, chiefly on upper and central coasts; casual—formerly rare—in and near western half, where reported since 1938 only in Kerr Co. (fide L. R. Wolfe), Lubbock Co. (nested, summer 1966, M. K. Rylander), and Hale Co. (fide N. E. Fry). Nonbreeders linger rarely throughout. *Migration:* Early Mar. to early June; mid-Aug. to early Nov. (extremes: Mar. 4, June 13; July 12, Nov. 21). Locally abundant to common throughout. *Winter:* Mid-Nov. to mid-Mar. Locally common to uncommon on lower coast and inland in south Texas; irregularly fairly common (chiefly on central and upper coasts) to rare throughout remainder.

HAUNTS AND HABITS: Normally leading the vanguard of North American fall ducks, the Blue-winged Teal leaves its slough, pond, and marsh breeding grounds with the first cool snap of August, or even late July. Winter range for *Querquedula discors* extends to Chile and Brazil—much farther south than winter quarters of most other nearctic ducks. Still exhibiting its preference for warm weather, many Bluewings linger well

into May before finally flying north to nest. This prolonged winter period leaves *Q. discors* with but a short time in which to nest, hatch, and rear young; however, Bluewing ducklings mature quickly under the alert eye of their mother. At all seasons, the Blue-winged Teal seeks sluggish, muddy fresh water, especially where aquatic plants grow. Very occasionally in winter it occurs in brackish coastal marshes.

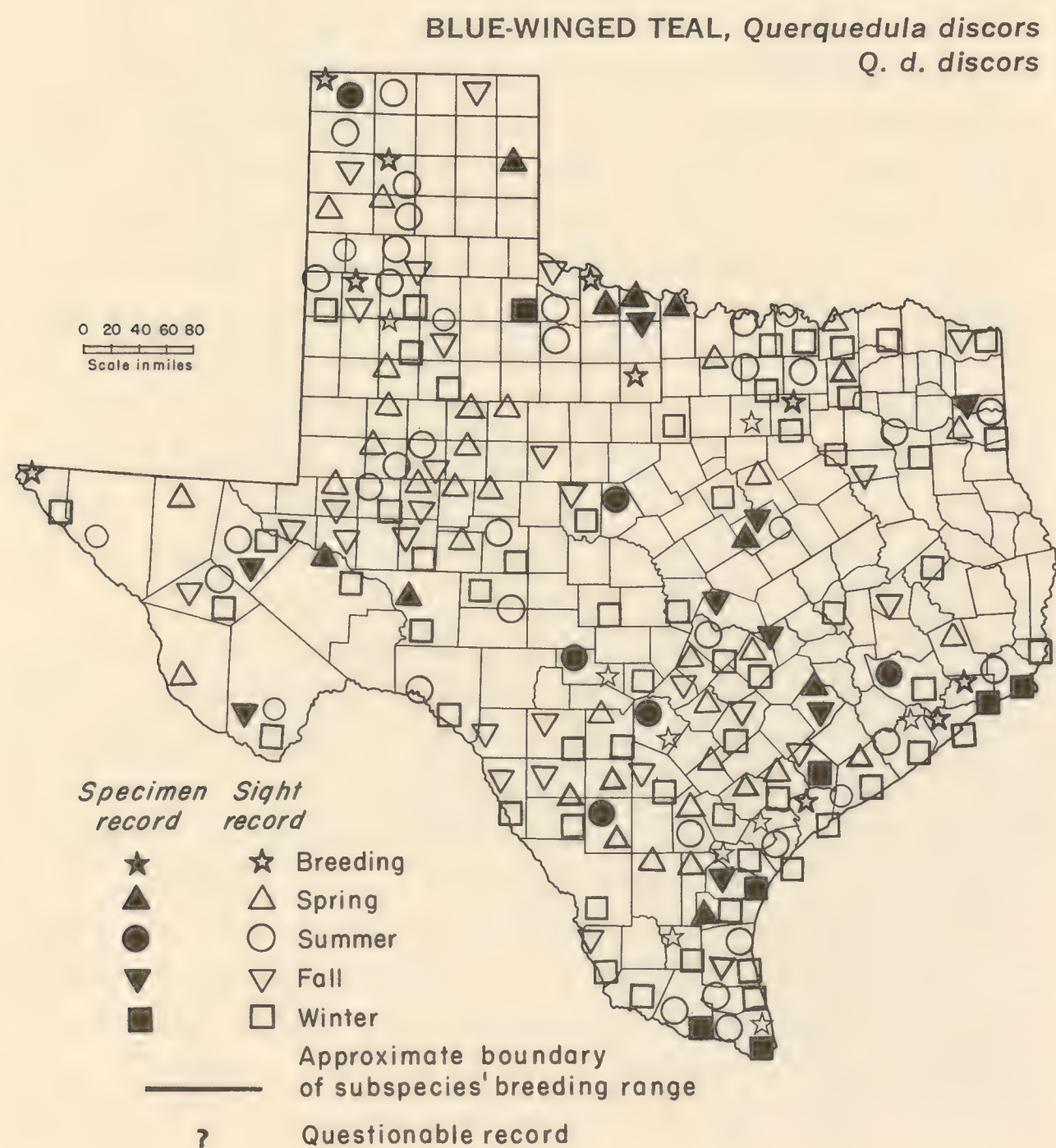
Migrant flocks fly in small to rather large compact groups. Often, when approaching a pond to rest and feed, they appear apprehensive and will circle cautiously, descend and rise again, perhaps several times, before finally settling on the water. They lift up easily when taking wing. This teal has long had the reputation of being an exceptionally fast flier. F. H. Yorke credited it with the speed of 130 m.p.h.; however, the fastest birds measured (via car speedometer) by Logan Bennett barely reached 48 m.p.h. On water, the Blue-wing takes food from, or just below, the surface. It usually goes only as deep as its bill can reach when head and neck are submerged; rarely, it dunks all of its forequarters and tips up. Sometimes individuals forage on the bank. Staples include seeds, stems, and leaves of sedges, grasses, pondweeds, smartweeds, burreed; also algae. In fall and winter, birds often drop into oat, wheat, barley, and other grain fields to feed. The present species eats a bit more animal matter, chiefly mollusks and insects, than does the Greenwing.

The faint-voiced Blue-winged Teal is usually silent. Soft, lisping, peeplike notes are sounded by the male, most often on the wing; the female rarely utters a *quack*.

DETAILED ACCOUNT: TWO SUBSPECIES

COMMON BLUE-WINGED TEAL, *Querquedula discors discors* (Linnaeus)

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial post-aestival molt. Top of head and narrow line next to base of bill fuscous black or chaetura black; hind-neck chaetura drab, more or less margined with dull white or buff; remainder of upper parts chaetura drab or chaetura black, feathers of lower neck and mantle with V-shaped markings of light buff or dull pinkish buff, lower back and rump with dull margins of deep neutral gray, longest lower tail-coverts black, and conspicuous patch on each side of rump pure white; tail fuscous, middle feathers fuscous black, all edged narrowly with buff or buffy white; wing-quills fuscous, inner webs of primaries brownish drab; outer webs of tertials alic blue or glossy greenish black, inner tertials with broad ochraceous buff shaft streaks; lesser and median wing-coverts alic or columbia blue; speculum metallic grass green bordered anteriorly by white bar formed by tips of greater wing-coverts; sides of head and of upper neck, throat, and anterior part of neck between deep mouse gray and hair brown, on upper part of neck with metallic purplish vinaceous sheen; broad white crescent on anterior part of side of head, extending from above the eye nearly to middle of throat, posteriorly bordered by narrow blackish line; chin fuscous; jugulum and rest of lower parts more or less tinged with pinkish buff, pinkish cinnamon, or dull tawny, and spotted with chaetura black or fuscous black; crissum dull black; lining of wing hair brown, middle portion and axillars pure white. Bill black or bluish black; iris burnt umber; legs and feet ochraceous, deep chrome, or dull orange; webs of toes and claws drab or brownish black. *Adult male, eclipse:* Acquired by complete post-



nuptial molt. Similar to adult female, but wings like winter-nuptial adult male; sides of head more heavily streaked and with some indication of white crescent on side of head. *Adult female, winter and nuptial*: Acquired by partial postnuptial molt. Pileum chaetura black or chaetura drab narrowly streaked with dull white; neck dull hair brown much mixed with white or pale buff; remainder of upper surface fuscous, feathers narrowly margined with hair brown and more or less barred or with V-shaped markings of pale buff or dull white; tail and inner webs of primaries and secondaries between fuscous and hair brown, tail more or less streaked or spotted with pale buff or white; outer webs of primaries and secondaries fuscous, lesser and median wing-coverts dull cadet gray; speculum and tertials between chaetura drab and dark grayish olive with only a trace of metallic sheen, speculum bordered anteriorly by narrow bar of white; sides of head pale buff, narrowly and thickly streaked or spotted with fuscous; chin and upper throat pale unmarked olive buff or buffy white; lower throat pinkish buff spotted with fuscous; jugulum dull cinnamon buff spotted or thickly streaked with fuscous; remainder of lower parts dull pale buff with spots or short broad streaks of drab or fuscous; lining of wing white, exteriorly hair brown with whitish margins. Bill bluish gray, greenish, or bluish black, tip and culmen dull black, mandible ecru drab; legs and feet dark cream buff; webs of toes and claws light drab. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but crown with narrower buff edgings; upper parts lighter, feathers with less conspicuous buff edgings; tail feathers with slighter edgings and with few or no buff markings. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to adult male but plumage duller; lengthened bluish-edged scapulars absent; greater coverts ordinarily with less white, and inner webs more marked with dark brown. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial male but still duller in coloration. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, but greater wing-coverts commonly with less white; general plumage somewhat duller. *Female, first winter*: Acquired by partial postjuvenile molt. Much the same as first nuptial female. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female, but lower parts paler, also with paler markings. Maxilla black, nail russet; mandible pale ochraceous buff, nail vinaceous buff; legs and feet greenish olive, but webs of toes clove brown, changing to sulphur yellow near toes. *Natal*: Upper parts brown, darkest on head and rump, and spotted on each side in front of wing, on hind edge of inner wing, on scapular, and on each side of rump with yellowish buff; under surface pale buff, sides of head and neck deeper; postocular stripe and auricular spot dark brown.

MEASUREMENTS: *Adult male*: Wing, 179.1–192.0 (average, 185.4) mm.; tail, 61.0–70.1 (65.3); bill (exposed culmen), 39.1–45.0 (40.6); height of bill at base, 15.0–17.0 (15.7); tarsus, 29.9–33.0 (31.8); middle toe without claw, 36.1–40.4 (38.4). *Adult female*: Wing, 170.9–177.0 (174.3); tail, 56.9–67.1 (62.7); bill, 36.6–40.9 (38.9); height of bill, 13.5–16.0 (14.7); tarsus, 29.9–32.0 (31.2); middle toe, 34.5–37.6 (36.3).

RANGE: S.e. Alaska, British Columbia, s. Mackenzie (Great Slave Lake), c. Manitoba, and s. Ontario, south to n. central California, Nevada, New Mexico, Colorado, n. Missouri, Virginia, and New York, rarely and locally to s. California, Texas, Oklahoma, and Louisiana. Winters chiefly from Texas (sparingly west to c. California), Tennessee, and North Carolina through Mexico and Central America to Peru and Brazil; also Clipperton Island, Galápagos, Bahamas, West Indies, and Trinidad.

TEXAS: *Breeding*: No specimen in breeding condition (see species account). Two summer specimens in counties where species has bred: Kerr Co., Ingram (June 5, 1915, A. P. Smith); Bexar Co., Lost Pond near Kirk (July 19, 1933, A. J. Kim). Two birds shot (specimens?) in Dallam Co., Buffalo Springs (July 31, 1903, A. H. Howell). *Migration*: Collected throughout winter range and north to Wheeler Co. *Winter*: Taken north to Cottle, east to Jefferson, south to Jackson and Cameron, west to Reeves (Oct.) cos.

NESTING: *Nest*: On open prairies, fields, marshes, meadows, or

islands; often on dry ground, sometimes on muskrat house; usually a well-concealed, well-built structure sunk in ground, in grass or sand; composed of weeds, grass, and dead leaves of marsh vegetation; lined with fine grass, down, and feathers. *Eggs*: 4–15, usually 10–12; ovate to elliptical ovate; smooth, not glossy; pale olive buff, dull white, cream color, or buffy white; unmarked; average size, 46.8 × 33.3 mm.

ATLANTIC BLUE-WINGED TEAL, *Querquedula discors orphana* (Stewart and Aldrich)

DESCRIPTION: *Adult male and female, winter and nuptial plumage*: Similar to *Q. d. discors*, and of same size, but upper parts of male darker, black areas less brownish; gray of head and neck deeper; lower parts darker, black portions less brownish, reddish brown markings and under surface of tail feathers and primaries darker. Female also with dark areas above and below more intensely black (less brownish).

MEASUREMENTS: *Adult male*: Wing, 180.1–193.0 (average, 186.2) mm.; tail, 61.0–69.6 (66.5); bill (exposed culmen), 35.1–43.4 (40.9); tarsus, 30.5–34.5 (32.3).

RANGE: In tidal marshes from Newfoundland (probably), south to New Brunswick, Prince Edward Island, Nova Scotia, New Jersey, Delaware, Maryland, and North Carolina. Has occurred in migration and winter from Michigan and Maryland to Texas, Gulf states, Florida, Cuba, and Colombia.

TEXAS: *Migration*: One specimen: Clay Co., Henrietta (Apr. 19, 1894, J. A. Loring).

CINNAMON TEAL, *Querquedula cyanoptera* (Vieillot)

SPECIES ACCOUNT

Anas cyanoptera of A.O.U. check-list, 1957 (see Appendix A). A small pond duck with blackish bill; yellowish legs; in flight, upperwing (like Blue-winged Teal) shows a chalk blue patch on forepart of inner wing and a green speculum. *Male*: dark cinnamon red above and below with black streaks on back; a few elongated buffy tertials; blackish rump, tail, crissum. *Female*: in field almost impossible to separate from female Blue-winged Teal; bill averages slightly longer and thicker at base; best judged by association with males. Length, 16 in.; wingspan, 25; weight, 13½ oz.

RANGE: S.e. British Columbia and s.w. Alberta, south through w. United States (east to Colorado and w. New Mexico) to n. Baja California, Jalisco, Chihuahua, and Tamaulipas; and in South America, in Andes of Colombia, and from s. Peru, Paraguay, and s. Brazil to Patagonia and Falkland Islands. Northern race winters from s. California and s. Texas through Mexico to Colombia, and probably Ecuador.

TEXAS: (See map.) *Breeding* (formerly): Apr. to Aug. (eggs, Apr. 27 to July 10; small young to Aug.) from about 200 to about 4,000 ft. Four definite records, all prior to 1937: Colorado Co., Eagle Lake (pair with 9 young, Aug., 1930, T. T. Waddell); Bexar Co., Mitchell Lake (young seen, June 22, 1916, R. W. Quillin); Potter Co., Amarillo (nest and egg found, July 10, 1924, G. M. Riddick); Dallam Co., Buffalo Springs (3 pairs, 1 with young and 2 with nests, July, 1936, Mrs. R. L. Duke). May have bred in Midland Co., Midland (said to breed, 1904, fide J. K. Strecker, Jr.), and El Paso Co.,

El Paso (fairly common in summer, 1935–1939, T. D. Burleigh, Lena G. McBee, T. M. Kirksey, A. H. McLellan, et al.). Only definite summer record since 1939: San Patricio Co., Welder Wildlife Refuge (pair present, June, 1962, Clarence Cottam); may have summered recently at Buffalo Lake Nat. Wildlife Refuge, Randall Co., and at Muleshoe Nat. Wildlife Refuge, Bailey Co. (fide U.S. Fish and Wildlife Service), also in Parmer and Yoakum cos. (fide Anne LeSassier). *Winter*: Early Sept. to late May (extremes: Aug. 19, June 18). Locally common to uncommon in western two-thirds and on central coast; scarce to very rare and irregular in eastern third (exclusive of central coast); in all areas, except south Texas, most numerous during spring and fall; virtually absent from northern Panhandle in winter.

HAUNTS AND HABITS: The handsome Cinnamon Teal is about equally North and South American—a situation which is approached by no other New World duck except the Ruddy. On its northern range, it further distinguishes itself by being the only species virtually confined to, and widespread in, the semiarid western part of the continent. Like its close relative, the Blue-winged Teal, this shallow-water duck seeks sluggish, tule-lined streams, irrigation ditches, ponds, marshes, reservoirs, and similar freshwater impoundments. The short fall migration is early and only involves a withdrawal from the colder northern portions of the duck's range.

Hybrids between *Q. cyanoptera* and *Q. discors* are rare in the wild but frequent in captivity. Their flight and behavior are quite similar, although the Cinnamon varies in two respects: In summer the male often helps rear the ducklings; and in the flocking season (fall and

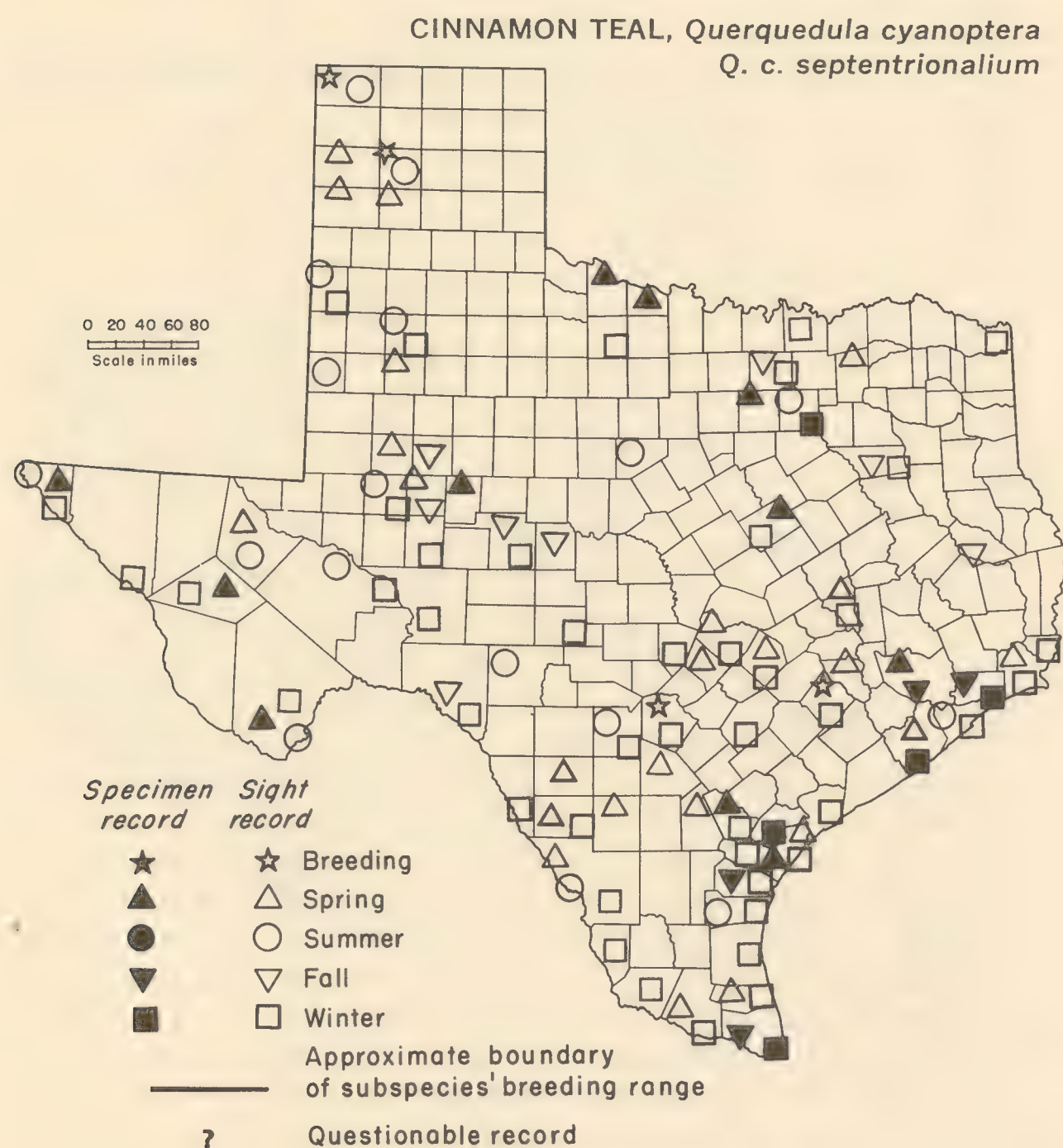
winter), the species shows itself to be less gregarious. The Cinnamon, although capable of diving, ordinarily feeds on the water's surface at or near shoreline, or up on the bank; it forages for seeds and soft parts of sedges, pondweeds, grasses, and smartweeds; a few insects and mollusks are consumed in the process.

The male occasionally emits a low rattling chatter; the female, a weak *quack*. Otherwise the Cinnamon Teal is silent.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTH AMERICAN CINNAMON TEAL, *Querquedula cyanoptera septentrionalium* (Snyder and Lumsden)

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Top of head fuscous black; middle of hindneck dull metallic olive green; lower neck and back dull sepia, feathers edged and barred with light dull chestnut, posteriorly with dull buff; lower back and rump dark grayish olive edged with lighter; middle upper tail-coverts fuscous black, edged with dull buff; lateral upper tail-coverts fuscous black, some edged with cinnamon; tail hair brown, middle feathers fuscous black; wing-quills chaetura drab, paler on inner webs; lesser and median wing-coverts alic blue to light alic blue, outer greater coverts white; speculum metallic grass green, secondaries very narrowly edged with dull white; outer webs of tertials dull black with greenish sheen, broad shaft stripes dull ochraceous tawny; scapulars mostly dull chestnut, barred or mottled with fuscous black; sides of head and of neck, throat, and rest of under parts chestnut, chin fuscous, abdomen tinged with fuscous, lower tail-coverts fuscous black, middle tail feathers fuscous; lining of wing mouse gray with bluish wash, inner coverts and axillars white. Bill black, margin of maxilla and of mandible tinged with pink; iris orange or ochre yellow; tarsus and toes orange or ochraceous buff; joints and webs of toes dull black. *Adult male, eclipse:* Acquired by complete postnuptial molt. Head and neck mottled with buff and brown; back dark brown, feathers narrowly edged with buff; lower parts brown, feathers broadly edged and otherwise marked with various shades of buff and rufescent brown; abdomen at first buff or white, more or less spotted with dark brown, later (by wearing off to tips of feathers) the posterior parts become colored as in female. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Upper parts between buffy brown and fuscous, crown very narrowly edged with dull cinnamon, hindneck very narrowly streaked or mottled with dull buffy brown or with fuscous; all feathers of remaining upper parts broadly margined with various shades of buff; tail fuscous, outer feathers dull hair brown, and middle feathers more or less mottled, and all broadly edged with dull cinnamon or buff, primaries and secondaries fuscous, inner webs paler; speculum chaetura drab, lesser and median wing-coverts dull cadet gray; sides of head and of neck dull pale buff, numerous streaked and spotted with fuscous; small buffy white spot on anterior part of lores; chin and throat pale pinkish buff, whitish on former, spotted anteriorly and narrowly streaked and spotted posteriorly with fuscous and dark hair brown; jugulum and breast cinnamon, former with large spots of fuscous, latter with fewer and smaller spots of same color; remainder of lower parts dull pinkish cinnamon to light pinkish cinnamon, posteriorly spotted with sepia; sides and flanks sepia broadly margined with various shades of buff and dull cinnamon; lining of wing anteriorly and exteriorly dull hair brown, posterior portion and axillars white, unmarked. Bill brownish gray, paler along margin of maxilla and on mandible; iris dark brown; feet and toes ochraceous drab, yellow, or pale orange. *Adult female, eclipse:* Acquired by complete postnuptial molt. Very much like winter-nuptial adult female. *Male, first nuptial:* Acquired by partial prenuptial molt. Much like winter-nuptial adult male, but colors less bright; wings and scapulars less perfectly developed; abdomen, to greater or lesser extent,



dark brown. *Male, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial male but much duller and with less completely chestnut plumage. *Female, first nuptial*: Acquired by partial prenuptial molt. Very similar to adult female. *Female, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial female but duller. *Male, juvenal*: Acquired by complete postnatal molt. Very much like adult female, but tertials and scapulars edged with cinnamon brown. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male, but wings decidedly duller. *Natal*: Upper parts mummy brown, darkest on crown; yellowish spot on each side of rump, on each scapular region, and on hind edge of wings; sides of head, superciliary stripe, and under parts dull yellow; side of head with dark brown postocular stripe and auricular spot.

MEASUREMENTS: *Adult male*: Wing, 175.0–199.9 (average, 185.7) mm.; tail, 63.5–75.9 (69.3); bill (exposed culmen), 42.4–48.0 (45.2); height of bill at base, 16.0–18.0 (16.8); tarsus, 30.5–35.1 (33.3); middle toe without claw, 37.1–41.5 (39.4). *Adult female*: Wing, 168.9–179.1 (174.8); tail, 61.0–69.1 (64.3); bill, 39.9–45.0 (42.4); height of bill, 15.0–16.0 (15.5); tarsus, 31.0–33.0 (32.3); middle toe, 36.1–39.1 (37.8).

RANGE: Identical with that of species in North America.

TEXAS: *Breeding*: See species account. *Winter*: Taken north to Wilbarger (Apr. 16), east to Dallas and Chambers, south to Cameron, west to Brewster (May 15) and El Paso (May 22) cos.

NESTING: *Nest*: In marshes, fields, or meadows, usually near water; amid grass, often on dry ground; in shallow depression of soil; bulky structure of grass, weeds, weed stems, cattails, tules, and sedges; lined with down and other feathers, though sometimes without lining. *Eggs*: 6–14, usually 10–12, ovate, elliptical ovate, or elliptical oval; pale buff, cream white, or white, unmarked; average size, 47.5 × 34.5 mm.

SHOVELER, *Spatula clypeata* (Linnaeus)

SPECIES ACCOUNT

A rather small duck with a large spatulate bill (black in male, brownish in female); orange legs. In flight, shows (above) a pale blue patch on inner forewing and a green speculum. *Male*: dark glossy green head, neck; dark brown back; white chest, scapulars, and flank-patches; cinnamon breast, belly, sides; black rump, crissum; white-edged black tail. *Female*: dark brown crown and streak through eye; brown-streaked buffy head, neck, and under parts; buff-tipped brown back. Length, 19 in.; wingspan, 31; weight, 2¾ lbs.

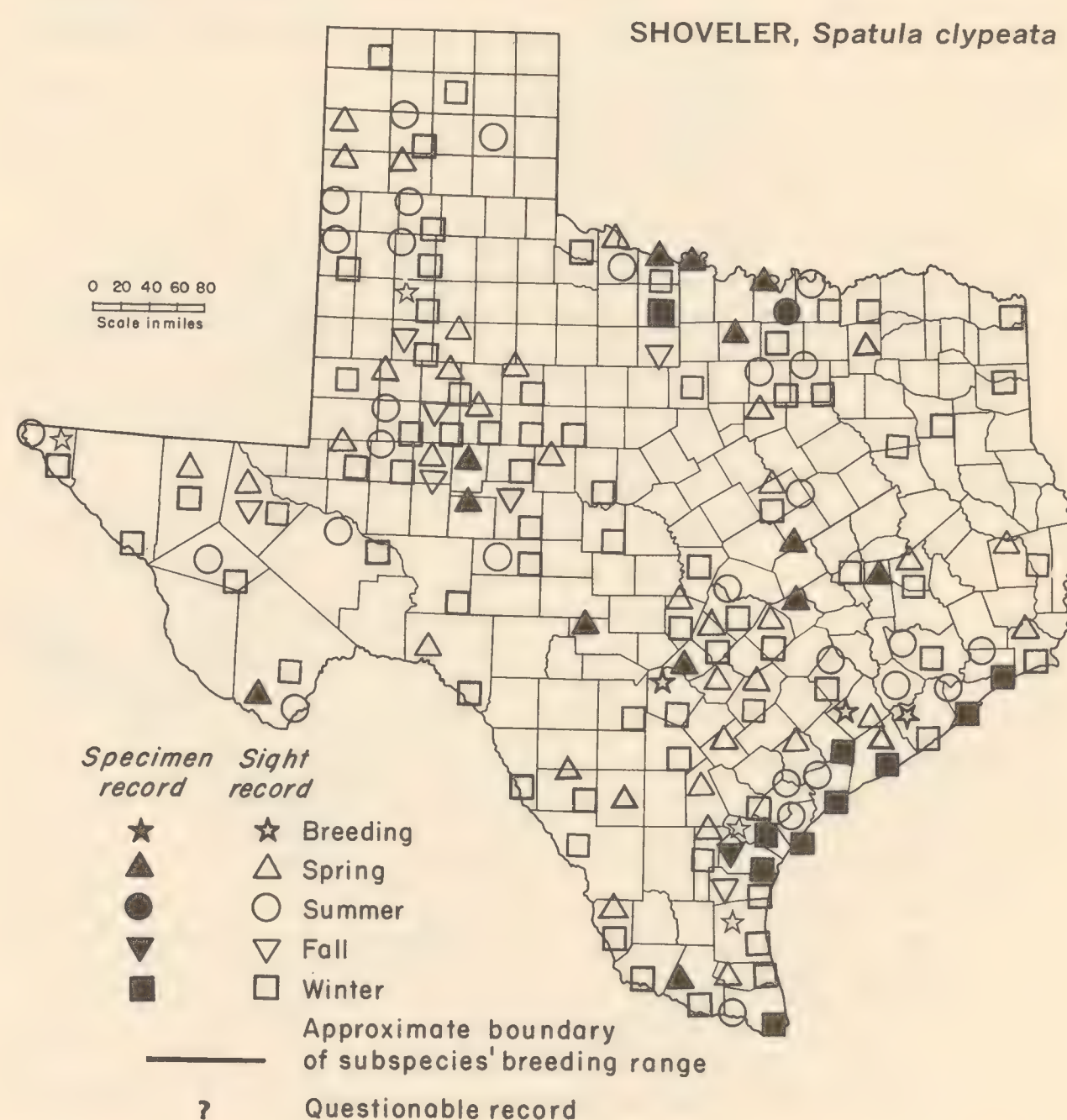
RANGE: Holarctic, chiefly between lat. 70° N. and lat. 35° N.; in North America, from c. western Alaska, n.w. Mackenzie, c. Saskatchewan, Manitoba, and Great Lakes region, south to Oregon, Utah, and Illinois, rarely and irregularly to s. California, New Mexico, Texas, and Oklahoma. Winters mainly between lat. 50° N. and Equator; in Western Hemisphere, from s. British Columbia, s. New Mexico, Texas, Gulf states, Florida, and Virginia through Mexico (including Baja California) to Costa Rica, occasionally to Panama and Colombia, also Hawaii and West Indies.

TEXAS: (See map.) *Breeding*: Apr. to July (eggs recorded, June 1; downy young, May 14 to June 30; half-grown young once as early as Mar.) from near sea level to 3,762 ft. At least eight records: Lubbock Co., Lubbock (pair nested, summer 1966, M. K. Rylander); Brazoria Co., Sandy Point (female with brood of small

young, June 30, 1927, F. C. Clarkson); Wharton Co., near East Bernard (female with ducklings 3–4 days old, May 14, 1905, J. H. Gaut); San Patricio Co., Ingle-side (2 broods brought off—1 with 12 ducklings, other with 15, early Apr., 1972, J. L. Estes); southern Kenedy Co. (adult with young, early Mar., 1968, fide Kay McCracken); Bexar Co., Mitchell Lake (nest with eggs, June 1, 1913, and 2 adults with young recently out of nest, June 22, 1916, R. W. Quillin); El Paso Co., El Paso (2 broods produced, summer 1961, LuVenia Arnold). May have bred in Galveston Bay, Chambers-Galveston cos. (young said to be common, late June–early July, ca. 1837, fide J. J. Audubon); and Cameron Co., Brownsville (July, ca. 1890, fide W. Lloyd). Scarce to rare and highly irregular as nonbreeding lingerer virtually throughout. *Winter*: Mid-Sept. to late May (extremes: Sept. 5, June 15). Locally very common—formerly abundant—to uncommon throughout; in northern two-thirds more numerous during spring and fall.

HAUNTS AND HABITS: The Shoveler is a holarctic breeder which wanders to northern South America, Hawaii, even Australia, in winter. This freshwater species haunts shallow, often stagnant, sloughs, creeks, and ponds fringed with dense vegetation; near coasts it sometimes occurs in brackish marshes. Since this duck is tolerant of muddy water, it is often seen, especially in the nonbreeding season, on sewage ponds and livestock watering tanks. Like its close kin, the Blue-winged and Cinnamon teals, the Shoveler cares little for cold weather. In more northerly breeding areas, the first autumn frosts spur it southward and it does not return until late spring.

Flight, especially of migrant flocks, is strong, steady, and direct; when startled, however, these ducks, like



teals, become swift and erratic on the wing. When taking off, the Shoveler, good puddle duck that it is, bursts up quickly and rises straight. With its oversized, spatulate bill, it is the best-equipped surface feeder among the dabblers. Both mandibles of its broad spoon bill are edged with bristlelike teeth (lamellae) that strain particles of food from the water and soupy mud. The soft rim of the bill, roof of the mouth, and tongue are extremely sensitive; thus, by touch and taste, the duck can retain or reject what morsels it wishes. Shovelers ordinarily shovel in very shallow water with head about half submerged; rarely do they tip up. Small, close-knit groups often mill in an ellipse in the water. Each duck churns up mud which the tracking individual strains for food: grass bits, buds, and shoots of rushes and other aquatic plants, small fish and frogs, tadpoles, leeches, crustaceans, and mollusks.

Shovelers are weak-voiced, rather quiet ducks. The male sounds a low *woh-who-woh* and *took-took-took*; the female's note is a faint *quack*. During courtship he calls a deep guttural *konk konk* and a rattling *chu-uck chu-uck*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Forehead and throat fuscous or fuscous black; remainder of head and upper neck bright metallic cossack green; middle of hindneck, with back, chaetura drab, this passing into chaetura black on rump and middle tail feathers, feathers of hindneck and back edged with hair brown, those of rump with fuscous; longer upper tail-coverts dull black, lateral feathers metallic cossack green; tail buffy white, middle feathers mostly dull hair brown and remaining feathers more or less mottled or striped medially with same color; primaries fuscous, inner webs brownish drab, shafts yellowish white; lesser and median wing-coverts cadet gray, ends of greater coverts white; speculum metallic grass green; outer webs of tertials greenish black, tertials and scapulars with broad central shaft streaks of white, one or more of scapulars cadet gray, remainder mostly white or of color of back; sides of hindneck and all jugulum and upper breast, with lining of wing, pure white; lower breast walnut brown; abdomen similar but somewhat paler; crissum dull black, laterally dull metallic cossack green; sides mostly cinnamon, narrowly vermiculated with fuscous; conspicuous patch on flank buffy white. Bill deep black but paler below, and extreme base of gonys light yellow; tongue pale flesh color; iris bright yellow, orange, or gamboge yellow; legs and feet orange-red or reddish orange, but webs of toes violet gray or ecru drab. *Adult male, eclipse:* Acquired by complete postnuptial molt. Very similar to adult female, but wings like those of winter-nuptial adult male, although inner secondaries are broader and have less pointed tips; breast with some white; remainder of breast and abdomen brown. Bill dark brown. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Upper surface between buffy brown and fuscous, crown and hindneck narrowly streaked with paler buff, hindneck most so, remaining upper parts broadly edged, barred, and spotted with light buff to pale pinkish buff and dull white; tail white or brownish white, middle feathers much barred and mottled with hair brown, fuscous, and drab; wings fuscous, inner webs of primaries brownish drab, lesser wing-coverts mouse gray, tips of greater wing-coverts and of outer webs of secondaries broadly white; speculum metallic cossack green, bordered anteriorly by bar formed by white tips of greater coverts; chin and upper throat light buff, unmarked; lower throat and sides of head and of neck light buff, narrowly streaked and spotted with fuscous; remaining lower parts dull cinnamon buff anteriorly, light buff posteriorly, much spotted

with hair brown, fuscous, and drab; lining of wing white or buffy white but posteriorly somewhat grayish, outer margin spotted with hair brown; axillars white. Bill greenish or grayish brown, but mandible dull orange; iris hazel; legs and feet orange, lighter than in adult male. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but head and hindneck with narrower feather edgings of buff; innermost secondaries with narrower light buff edgings. *Male, first nuptial:* Acquired by partial prenuptial molt. Very similar to adult male, but wing-coverts ordinarily duller, greater coverts with narrower white tips; wing-quills more worn. *Male, first winter:* Acquired by partial postjuvenile molt. Much like juvenile male, but with intermixture of feathers of adult on back, rump, upper tail-coverts, and other parts; tail as in adult male. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to adult female, but wings darker and duller. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to first nuptial female, but upper parts with paler buff edgings. *Male, juvenile:* Acquired by complete postnatal molt. Similar to adult female but usually lighter; breast washed with chestnut or tawny; abdomen rather light chestnut. Bill dull flesh color; legs and feet orange; iris dark brown. *Female, juvenile:* Acquired by complete postnatal molt. Similar to juvenile male, but speculum duller and with little or no metallic green; remainder of wing duller. Maxilla olive slate, but sides and base olive gray; mandible ochraceous buff; nail of bill pale gray; legs and feet mottled olive and buffy yellow. *Natal:* Pileum, middle of hindneck, and narrow postocular stripe, with posterior lower parts, clove brown; back buffy brown, with cream buff spot in front of each wing, another on each scapular region, and another on each side of rump; superciliary stripe and sides of head and of neck clay color; chin and throat dull cream buff; remainder of lower parts dull cartridge buff.

MEASUREMENTS: *Adult male:* Wing, 230.1–250.0 (average, 237.2) mm.; tail, 77.0–87.9 (82.3); bill (exposed culmen), 59.9–67.6 (62.7); height of bill at base, 18.5–23.1 (21.4); greatest width of bill, 27.9–32.0 (29.7); tarsus, 36.1–40.9 (37.8); middle toe without claw, 42.9–47.0 (44.7). *Adult female:* Wing, 217.9–227.1 (223.3); tail, 72.9–84.6 (77.5); bill, 55.9–61.5 (59.2); height of bill, 17.5–23.9 (20.3); greatest width, 25.9–29.9 (27.4); tarsus, 36.1–39.1 (36.6); middle toe, 37.1–46.0 (42.2).

TEXAS: *Breeding:* See species account. *Winter:* Taken north to Wichita (Apr. 1), east to Chambers, south to Cameron, west to El Paso (exact date unknown) cos.

NESTING: *Nest:* In open marshes; on meadows, prairies, or islands in lakes, sometimes far from water; well hidden on ground in dry or damp places, concealed by grass or bushes; in hollow of ground; composed of dead weed stems and grass; lined with dry grasses, down, and other feathers. *Eggs:* 6–14, usually 10–12; elliptical ovate to elliptical oval; smooth, not glossy; dull gray or pale olive buff to pale greenish gray; unmarked; average size, 52.3 × 37.1 mm.

WOOD DUCK, *Aix sponsa* (Linnaeus)

SPECIES ACCOUNT

Carolina Duck of Old World authors. Indisputably beautiful—male gaudily, female subtly. A rather small duck with small bill, large head, short neck, long square blackish tail. *Male:* long swept-back crest; iridescent green, bronzy, purplish, and blue above; two white lines on side of head (one from base of bill over eye, one from behind eye) extending to end of crest; white chin and throat with two white prongs reaching up vertically on either side of neck; glossy brown chest flecked with white; two vertical bars (one white, one black) separating chest and reddish buff sides; white



Wood Duck, *Aix sponsa*
female (left), male (right)

Louis Agassiz Puertes.
1902

breast and belly; red and white bill; red eyes. *Female*: shorter crest; grayish brown above; white chin, throat, base of bill, and eye-patch; whitish-streaked brownish chest and sides; otherwise white below; black bill; brown eyes. Length, $18\frac{1}{4}$ in.; wingspan, $28\frac{3}{4}$; weight, $1\frac{1}{4}$ lbs.

RANGE: S. British Columbia to c. California, and from s. Manitoba (Lake Winnipeg), n. Minnesota, s. Quebec, and Nova Scotia, south to e. Texas, Gulf states, and Florida; also Cuba (resident). Winters chiefly from Oregon to s. California (a few), and from e. Texas, Tennessee, and Maryland to n. Mexico (occasionally) and Florida; also n.w. Bahamas and Jamaica (at least formerly).

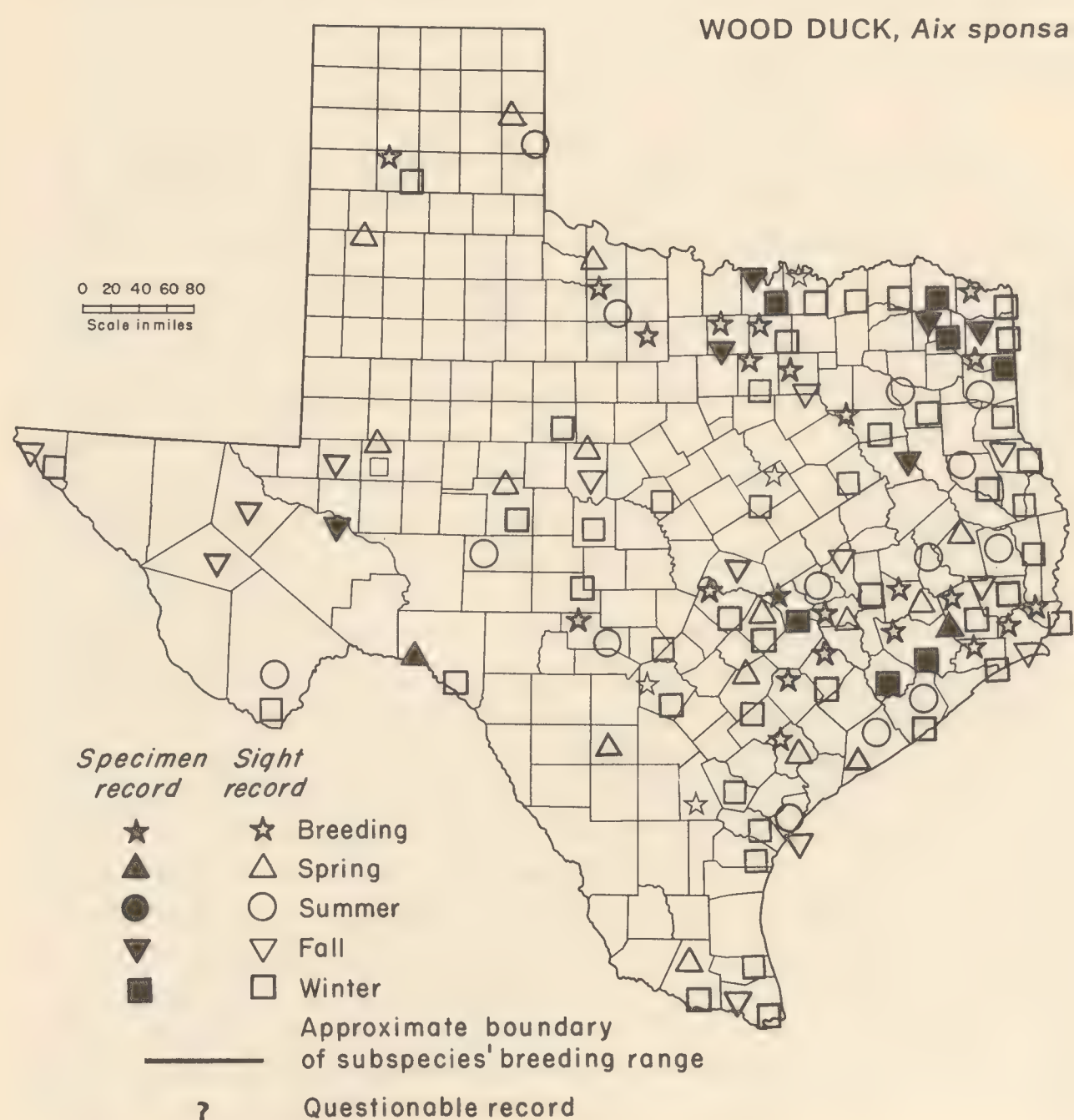
TEXAS: (See map.) *Resident* (largely): Breeds, mid-Feb. to early Sept. (eggs, Mar. 1 to July 15; downy young, Mar. 14 to Apr. 20; half-grown young as late as Aug. 25) from near sea level to about 3,500 ft. Locally fairly common to rare over lowland wooded portions of eastern half and on Edwards Plateau west to Kerrville; has bred northwest in Baylor Co., Lake Kemp (eggs found, June 5, and July 5 and 15, 1939, R. L. More) and even Randall Co., near Canyon (female and 11 young, July 11, 1943, A. S. Hawkins); casual in summer in Tom Green, Schleicher, and Brewster cos. Rare and irregular migrant and winter visitor in Panhandle, Trans-Pecos, and coastal marshes.

HAUNTS AND HABITS: The American Wood and the Chinese Mandarin are generally conceded to be the two most ornamental ducks on earth. Although *Aix sponsa* hybridizes readily with practically any dabbling or even diving duck, the Chinese *Aix galericulata* does not cross with its supposed nearest relative in zoos or elsewhere. In fact, Mandarin chromosomes are incompatible with those of any other species of duck.

In forested parts of North America, the Wood Duck dwells in wooded terrain laced with slow streams and dotted with swamps, ponds, lakes, and reservoirs. This species, almost endemic to the old forty-eight United States and Cuba, nests farther south than most other nearctic waterfowl. Thus, in Texas, it is the only wild duck which is a widespread and regular inland nester. Unlike the other American dabbling ducks, *Aix sponsa* consistently nests in tree cavities, created by either decay or woodpeckers, especially the Pileated. The hole is from a few to fifty feet above ground; any species of tree will do. Where natural nesting sites are scarce, Wood Ducks sometimes accept birdhouses, provided the entrance is four inches or more in diameter. When the ducklings are ready, they use the hooked nail on their beaks and their sharp claws to climb up to the entrance hole of the nest cavity; then they leap out to join their mother who is calling them from the ground. The downies are too light to be hurt by the fall. Ordinarily within five minutes she leads her brood to water. Northern individuals in small flocks, probably family parties, withdraw during cold months; chief winter quarters are the Gulf states, but this species is so tied to fresh water that it very seldom visits seacoasts.

The Wood Duck is an extremely agile flier. At speeds up to 50 m.p.h. it smoothly and silently threads its way through intricate mazes of branches without so much as touching a twig. The ample tail is the chief steering device. On the wing, posture is distinctive—both sexes fly with head elevated above body level and bill angled downward. This duck is quite at home on land, where it does much of its foraging. Wood Ducks are also good swimmers and take food from the surface of the water; occasionally they tip up in shallows to feed on bottom matter. The 90-percent-vegetable diet consists largely of seeds, leaves, stems, tubers, and roots of duckweeds, waterlilies, bulrushes, various grasses, pondweeds, and many other aquatic plants. Water-chinquapin (*Nelumbo lutea*) is a particularly favored winter item in some areas. In summer and fall dogwood (*Cornus*) fruit is gulped down. Acorns, pecans, hickory, and beechnuts are also avidly consumed. The duck's powerful gizzard promptly grinds shells to bits. Formerly, American chestnuts were relished, but the imported chestnut blight eliminated this item between 1904 and 1920. Spiders are favorite animal food; a few dragonflies, damselflies, beetles, locusts, grasshoppers, and crickets are also taken. At night this duck roosts in open woodland pools.

The Wood Duck is very loquacious, but usually soft spoken; groups are particularly chatty when feeding. An exception to the usual low notes is a loud *whoo-eeek*, given as the bird flushes. The male's vocalizations include a long series of whistled *hoo-w-eet*, *hoo-w-ett's*, a *chick-a-waugh*, also *cheep-cheep*, a mellow *peet-peet*, and a high-pitched *jeee* with a rising inflection. A mildly startled female utters a sharp *cr-r-ek*, *cr-r-ek*, etc. She talks to her ducklings with soft, drawn-out *pe-ee's*; they answer with mellow, often rapidly sounded *pee*, *pee*, *pee's*.



CHANGES: The Wood Duck was greatly reduced in numbers from the 1890's to 1918. Chief causes of its diminution were deforestation and heavy shooting (both for its tasty flesh and its highly attractive feathers, used for making fishing flies). In 1918, a totally closed season on the species was legislated in the United States and Canada. By 1941, Wood Ducks had increased, and in this year, it became legal in several states to include one *Aix sponsa* in a bag limit.

Several developments since 1940 appear to have helped the Wood Duck: The decline in rural population means that fewer boys are roaming the woods shooting everything in sight. Game and trespass laws are nowadays better enforced. In some places, nesting trees are left standing or nest boxes are provided. Many lakes and state parks were created in wooded areas during the 1940's, 1950's, and 1960's. By early 1970's, pairs of Wood Ducks were even searching for nest sites in city parks, such as Eastwoods in Austin, Texas.

Aix sponsa is highly unlikely to become as abundant as the House Sparrow, however. Timber companies, which control nearly all the forested lands of Texas, continue to eliminate hardwoods—which provide acorns, nuts, and most nest sites—to make room for pure pine plantations. Said pines produce little or no Wood Duck food and are harvested before they are old enough to have cavities. Pollution also takes its toll of waterfowl habitat. Finally, the old drags on Wood Duck population are still operating to some extent. Feathers remain attractive as trout lures. Taxidermy is a declining craft, but even today the most common bird in a taxidermist's freezer is likely to be *Aix sponsa*, the duck seemingly dressed in wedding finery. Moths chew on countless mounted Wood Ducks in hunters' dens, and replacements are sought.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Top of head, lores, and subocular stripe metallic grass green; remainder of sides of head blackish red purple, narrow superciliary stripe and narrow stripe on each side of back of head white; pointed crest of metallic green, purple, and white feathers; chin, upper throat, and vertical bar extending to auriculars and another almost around back of neck pure white, this enclosing on sides of upper neck a large patch of metallic sayal brown; hindneck, back, and rump deep olive, posteriorly dark olive; upper tail-coverts metallic dusky olive green; tail same, inner webs of rectrices fuscous; primaries mostly fuscous, inner webs drab, tips metallic bluish green, outer webs of posterior portion silvery grayish white; superior wing-coverts dull hair brown, median and greater wing-coverts mostly metallic bluish green, inner greater coverts blue or violet; inner secondaries forming speculum metallic terre verte green on outer webs, innermost feather metallic blackish red purple with bronzy sheen; outermost scapulars and outer webs of tertials deep black with violet sheen; remaining scapulars metallic olive green; secondaries conspicuously tipped with pure white; breast olive brown anteriorly, drab posteriorly, with triangular spots of white, these largest and almost obscuring drab color posteriorly; broad white bar succeeded posteriorly by broad black bar on sides of breast; sides of body olive buff finely vermiculated with deep olive; flank feathers with broad bars of black and white

terminally; sides of rump metallic anthracene purple; lower breast, abdomen, and anterior lower tail-coverts white; remainder of lower tail-coverts sepia; lining of wing and axillars white, both mostly barred or mottled with brownish drab and hair brown. Bill with nail, mandible, most of basal part of culmen, cutting edges, and bare space on chin deep black; oblong space from nostril to nail white, a line along basal portion of bill gamboge yellow; remainder of bill dragon blood red; iris orange-red or raw umber; eyelids deep vermilion; legs and feet orange, pale ocher yellow, or dull cream yellow, but webs and joints dark brown. *Adult male, eclipse:* Acquired by complete postnuptial molt. Similar to adult female, but postocular white spot smaller; wings much as in winter-nuptial adult male; posterior lower parts whitish, with dark brown spots. Bill, eyes, and feet somewhat duller than in nuptial adult male. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Pileum chaetura drab, unmarked; hindneck olive brown; back brownish olive; rump deep brownish olive; tail dark olive brown; all these parts with metallic sheen; wing-quills fuscous, inner webs rufescent drab; lesser wing-coverts dull hair brown; speculum dull metallic blue-green and anteriorly dark purple, secondaries broadly tipped with white, forming posterior border to speculum; inner wing-coverts metallic bluish green and metallic dark purple; scapulars and tertials metallic bronzy olive; large oblong spot surrounding eye (but mostly posterior), narrow line around base of bill, together with chin, upper throat, lower breast, and abdomen, white; sides of head hair brown; jugulum light drab; upper breast cinnamon buff spotted with buffy brown; sides and flanks buffy brown margined with buffy white; crissum white, mottled and laterally streaked with olive brown; lining of wing white, much mottled with hair brown. Bill deep plumbeous, with large white spot on each side; nail and culmen black; eyelids cream yellow; iris raw sienna; legs and feet yellowish brown. *Adult female, eclipse:* Acquired by complete postnuptial molt. Little different from winter-nuptial adult female. *Male, first nuptial:* Acquired by wear from first winter. Much like adult male but somewhat duller. *Male, first winter:* Acquired by postjuvenile molt. Practically same as first nuptial male. *Female, first nuptial:* Acquired by wear from first winter. Practically identical with adult female. *Female, first winter:* Acquired by postjuvenile molt. Like first nuptial female. *Male, juvenal:* Acquired by complete postnatal molt. Similar to adult female, but posterior lower parts much darker and marked with dark brown; jugulum and flanks tinged with buff or light brown. *Female, juvenal:* Acquired by complete postnatal molt. Similar to juvenal male, but wing duller; crown lacking any greenish luster; white surrounding eye more noticeable; white on sides of throat less extensive toward cheeks and sides of neck. Maxilla slate black, but base plumbeous, nail black, walnut brown in middle; mandible white mottled with black; legs and feet light blue-gray, mottled with olive brown; webs of toes and claws black. *Natal:* Upper parts dark brown; pale yellowish spot on each side of rump and on each wing; sides of head and of neck cream color or dull yellow; lower parts pale dull yellow.

MEASUREMENTS: *Adult male:* Wing, 210.1–230.1 (average, 218.2) mm.; tail, 94.0–106.9 (101.9); bill (exposed culmen), 32.0–36.1 (33.8); height of bill at base, 15.5–18.0 (16.3); tarsus, 34.5–38.1 (35.8); middle toe without claw, 39.9–46.5 (42.7). *Adult female:* Wing, 210.1–223.0 (215.1); tail, 91.9–102.1 (96.8); bill, 30.5–35.1 (32.8); height of bill, 15.0–16.5 (15.5); tarsus, 32.0–36.6 (34.8); middle toe, 39.1–45.0 (41.1).

TEXAS: *Resident* (largely): Collected north to Cooke, east to Red River, south to Liberty and Fort Bend, west to Travis cos. Two specimens taken outside breeding range: Val Verde Co., Devils River (Apr. 23, 1864, H. E. Dresser); Pecos Co., Fort Stockton (Oct. 19, 1864, P. Duffy).

NESTING: *Nest:* In swamps and woodlands, usually near water but sometimes at considerable distance; in cavity of tree or stump, often high above ground; sometimes over water, occasionally on ground, in building, at bottom of a chimney, or in nest of woodpecker or squirrel; made of twigs, wood fragments, grass, and down; lined with dry grass, other vegetation, feathers, and down. *Eggs:* 6–31, usually 10–15; elliptical oval or oval; pale

buff, buffy white, or cream white; unmarked; average size, 51.1 × 38.9 mm.

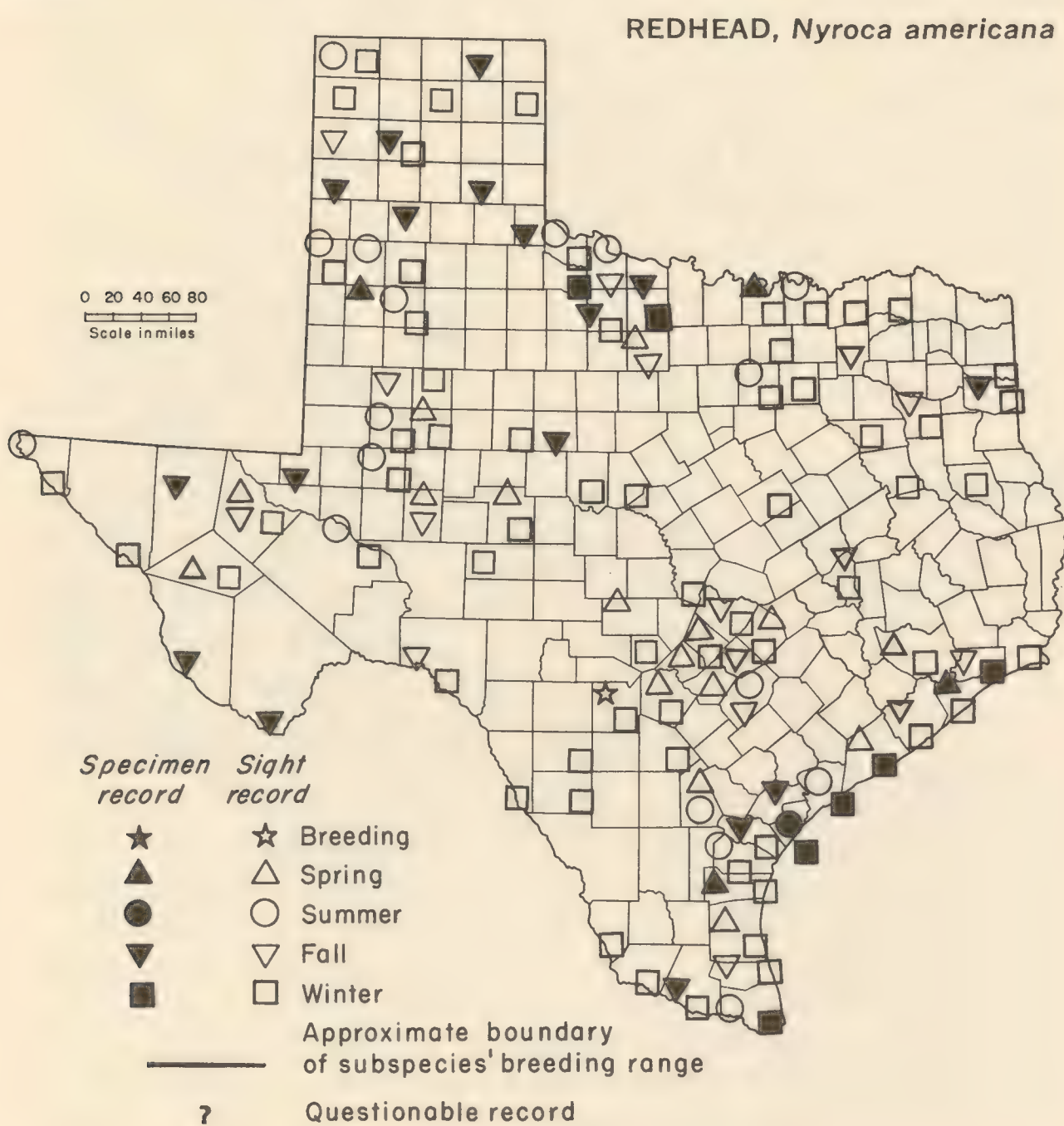
REDHEAD, *Nyroca americana* (Eyton)

SPECIES ACCOUNT

Aythya americana of A.O.U. check-list, 1957 (see Appendix A). A rather large, short-necked, round-headed bay duck; has blue-gray bill with black tip and faint whitish subterminal ring; in flight, broad gray stripe extends full length of wing. *Male*: reddish head and upper neck; black lower neck, chest, rump, tail, crissum; gray back, sides; white breast, belly. *Female*: brownish above, on chest, sides, and crissum; whitish breast and belly. Length, 19¾ in.; wingspan, 32¾; weight, 2½ lbs.

RANGE: C. British Columbia, n.w. Saskatchewan, s.e. Manitoba, and w. Minnesota, south locally and irregularly to c. California, Arizona, n.w. New Mexico, s. Colorado, and w. Nebraska. Winters chiefly from California, Texas, Tennessee, Ohio, and Chesapeake Bay to Baja California, State of México, and Tamaulipas.

TEXAS: (See map.) *Breeding* (formerly): One definite record: Medina Co., Chacon Lake (6 very young birds, first week of Aug., 1928, A. J. Kirn; after Aug. 7, 2 young present until Aug. 11; 8 adults also seen at same location, July 7, 1928). May have bred in Dallam Co., Buffalo Springs (seen in summer of 1933 and said to breed, Mrs. R. L. Duke). Rare and highly irregular in summer over much of state. *Winter*: Mid-Oct. to mid-May (extremes: Sept. 3, June 13). Locally abundant to common on lower and central coasts; irregularly common to uncommon elsewhere throughout; in northern two-thirds most numerous during spring and fall.



HAUNTS AND HABITS: The handsome Redhead is the first of the Aythyinae. These lake and bay ducks are excellent divers; their big webbed feet, lobed on the hind toe, propel them powerfully through the water. *N. americana* breeds chiefly in the central Canadian provinces and northern midwestern United States—areas mostly gone to settlements and farming, especially of wheat. Cattail (*Typha*) and bulrush (*Scirpus*) sloughs and swamps are summer haunts for this duck. In fall, Redheads move to winter on coasts where they prefer brackish estuaries and freshwater ponds a bit inland.

Migrant flocks fly in swift-moving V-formations, which probably move about as fast as Canvasbacks; generally they travel in groups unmixed with other species. Over feeding grounds, large irregular parties often take early morning or dusk flights. Redheads rafting in the middle of a lagoon often exhibit curious behavior: All or part of this assemblage, roiling the water for no obvious reason, will take wing in a confused, hurried manner, only to settle on water nearby or fly to some more distant part of the lagoon. When feeding, usually in morning and evening, the Redhead dives in deep or shallow (10–12 ft.) water for leaves, stems, and bulbs of aquatic plants, or it dabbles with surface-feeding ducks for insects, frogs, tadpoles, and small fish. It also feeds at night, especially by moonlight or electric lights of fishing piers. At such times individuals often utter their hoarse notes as they busily forage. Wildcelery (*Vallisneria americana*) is a particularly favored winter food; other plants recorded for the species include common frogbit (*Limnobium*), wildrice (*Zizania*), *Iris*, waterlily (*Nymphaea*), cowlily (*Nuphar*), waterstarwort (*Callitriche*), parrotfeather (*Myriophyllum*), and bladderwort (*Utricularia*).

The usual note of the Redhead is a guttural rolling *r-r-r-r-r* or *r-r-r-r-wha*, *r-r-r-r-wha*. The male utters a deep catlike *me-ow* and in spring (seldom in autumn) a *qua-qua*. Females *squak* when lifting from water. In courting, the drake sounds a drawn-out, high-toned, groaning *whew-ough*; she rattles a *quek*, *que-eek*.

CHANGES: For a northern duck, the Redhead nests relatively far south (exposing itself to much civilization) on a comparatively small breeding range; therefore, the species would be expected to be in trouble. Actually its decline appears to be moderate. Examination of Audubon Christmas Bird Counts at Laguna Atascosa National Wildlife Refuge, Cameron County, from 1949 through 1970 reveals no steep, long-term diminution. It should be noted, however, that the count of 555,157 individuals on January 3, 1954, is much higher than any made since then. Also the two worst counts (50 on December 28, 1962, and 3,050 on December 23, 1970) were both made after the 1957–1961 period, which was a disastrous time in Texas for the Brown Pelican and several other large water birds.

A curious attrition of wintering Redheads occurs in lower Laguna Madre (chiefly in Willacy and Cameron cos.) where the ducks get caught on fish hooks dangling from fishermen's trotlines. Between November 15, 1966, and February 12, 1967, 21,914 Redheads were

found on these hooks. Of this number, 3,267 died, 7,459 had a poor chance of survival, and 11,188 apparently recovered (see C. A. McMahan, R. L. Fritz, 1967, *Journal of Wildlife Management* 31: 783-787).

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Entire head and upper throat chestnut, glossed posteriorly with metallic bordeaux purple; hindneck chaetura drab to chaetura black; upper back and scapulars pallid neutral gray, vermiculated with chaetura drab and hair brown; lower back fuscous, somewhat vermiculated with neutral gray; upper tail-coverts blackish clove brown; tail hair brown, edges of feathers paler and more buffy; primaries fuscous, inner webs and basal portions of inner primaries drab; wing-coverts mouse gray, slightly vermiculated with dull white; outer portion of speculum grayish tilleul buff, inner part neutral gray, outer edges of inner feathers narrowly black; jugulum and upper breast fuscous; lower breast and abdomen white; sides and flanks coarsely, posterior abdomen finely, vermiculated with hair brown and drab; crissum fuscous black; lining of wing white; edge of wing smoke gray. Maxilla pale grayish blue or plumbeous with faint whitish subterminal ring; tip and rest of bill black; iris red, cadmium yellow, or lemon yellow; legs and feet bluish gray or olive gray, webs of toes dull black. *Adult male, eclipse:* Acquired by complete postnuptial molt. Similar to adult female, with much brown in plumage both above and below; crissum with much light edging. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Above olive brown, back and mantle more grayish; back, lower hindneck, and scapulars broadly edged with hair brown, feathers of primaries and secondaries fuscous, inner webs and basal portions of all drab; wing-coverts dull hair brown; speculum drab gray to neutral gray; sides of head dull buffy brown; throat and anterior part of lores white, buffy white, or dull brownish white, with some spots of clove brown; lining of wing white, outer edge light hair brown; jugulum fuscous and breast hair brown, feathers of both margined with white or buffy white, much more broadly on latter; sides dull buffy brown, edged with pale buff or dull white; abdomen and crissum drab with whitish or pale buff edgings; longest lower tail-coverts mostly white. Bill plumbeous, dull blue, olive gray, or olive black, sometimes with subterminal whitish ring, tip and median line black; iris mummy brown, hazel, or yellow; legs and feet plumbeous greenish gray or gray, but webs of toes and claws blackish slate. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but upper parts dulled by lighter edgings of feathers; under surface mottled with dull brown. *Male, first nuptial:* Acquired by wear from first winter. Similar to winter-nuptial adult male but somewhat duller. *Male, first winter:* Acquired by partial postjuvenile molt. Similar to first nuptial male, but black feathers with light brown edgings. *Female, first nuptial:* Acquired by wear from first winter female. Practically identical with adult female. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to first nuptial female. *Male, juvenal:* Acquired by complete postnatal molt. Similar to adult female, but lower parts less clearly white, posteriorly much mottled with hair brown. Maxilla slate color, cutting edges plumbeous, tip fawn color; mandible light vinaceous buff mottled with plumbeous; iris mummy brown, outer ring sulphur yellow; legs and feet dull olive buff, but webs of toes mouse gray; claws brownish black. *Female, juvenal:* Acquired by complete postnatal molt. Similar to juvenal male but lighter and less brownish, especially on head and breast. *Natal:* Upper parts olive brown, with six lateral dull yellow spots; sides of head and of neck, with lower parts, yellowish buff, paler posteriorly. Bill and feet light brownish.

MEASUREMENTS: *Adult male:* Wing, 218.9-233.9 (average, 228.1) mm.; tail, 52.1-62.0 (56.9); bill (exposed culmen), 46.0-49.5 (48.0); height of bill at base, 18.5-22.6 (20.3); tarsus, 40.9-45.0 (42.9); middle toe without claw, 59.9-67.1 (63.2).

Adult female: Wing, 209.0-224.1 (219.7); tail, 54.1-59.9 (57.2); bill, 44.4-47.5 (45.7); height of bill, 19.0-21.1 (20.3); tarsus, 39.9-42.9 (40.6); middle toe, 57.9-62.5 (61.2).

TEXAS: *Breeding* (formerly): See species account. *Winter:* Taken north to Ochiltree (Nov. 14), east to Archer, Marion (Nov. 2), and Chambers, south to Cameron, west to Culberson (Oct. 24) cos.

NESTING: *Nest:* In marshes, sloughs, or shallow marshy lakes; amid vegetation, often over water; rather bulky bowl of reeds, flags, grasses, weeds, and other aquatic plants; lined with reeds, feathers, and down. *Eggs:* 6-27, usually 10-15; elliptical oval to elliptical ovate or oval; smooth and glossy; pale olive buff, pale cream buff, or greenish drab; unmarked; average size, 61.2 × 43.2 mm.

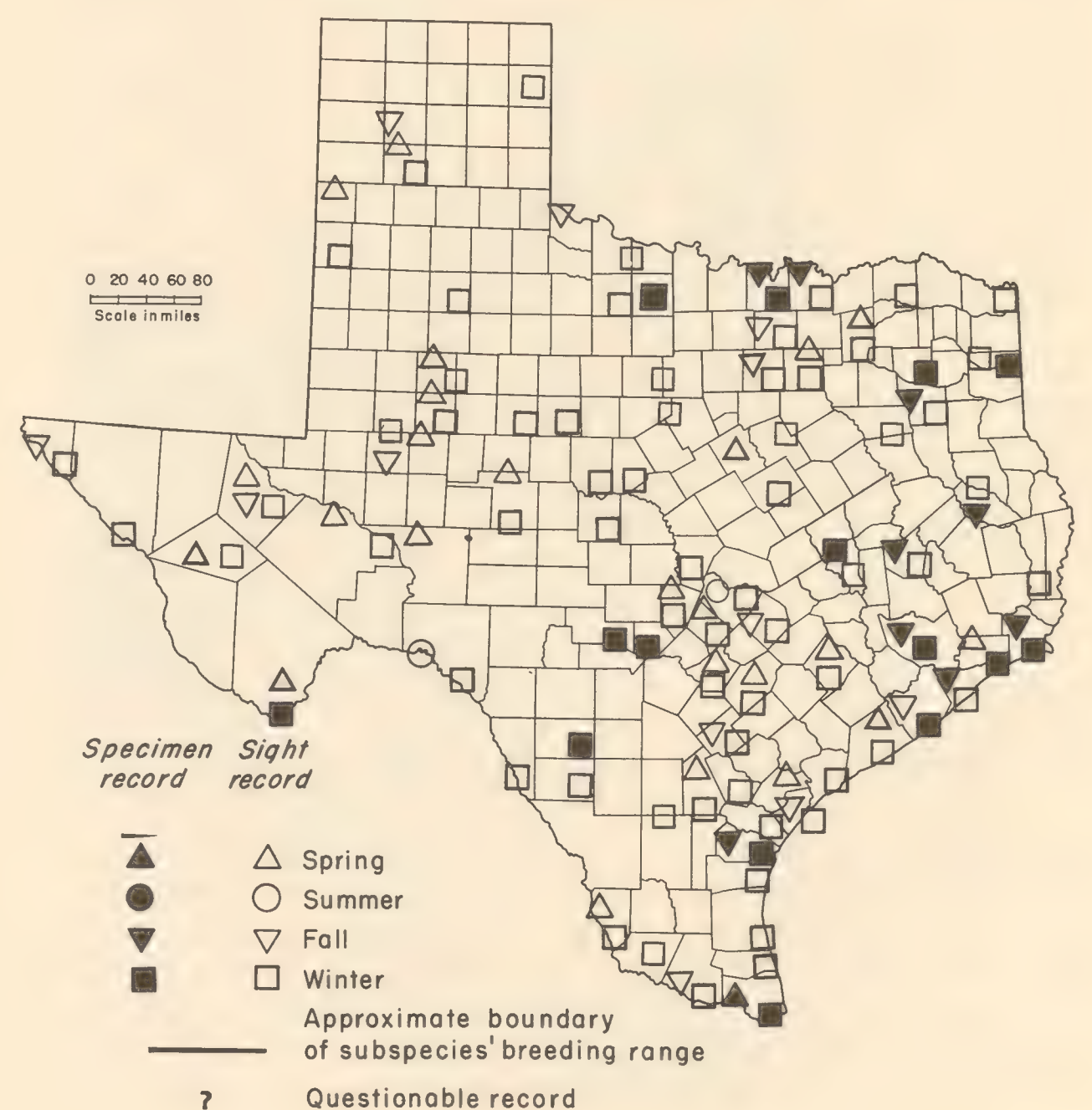
RING-NECKED DUCK, *Perissonetta collaris* (Donovan)

SPECIES ACCOUNT

Aythya collaris of A.O.U. check-list, 1957 (see Appendix A). A rather small diving duck with peaked crown (especially male) due to elongated crest feathers; has blue-gray bill with black tip and distinct white subterminal ring (male also shows white ring at base); in flight, reveals gray stripe on trailing edge of wing. *Male:* purple-glossed black head and neck; dark chestnut neck-collar (ineffectual field mark); black chest, back, tail, crissum; vertical white wedge on side in front of wing; finely gray-vermiculated white sides; white on remaining under parts. *Female:* brown above, on chest, sides, crissum; whitish mottling on face at base of bill; white chin, throat, eye-ring, and thin line behind eye; whitish below. Length, 17 in.; wingspan, 27¾; weight, 1¾ lbs.

RANGE: S. Mackenzie (Great Slave Lake), n. Manito-

RING-NECKED DUCK, *Perissonetta collaris*



ba, c. Quebec, and Newfoundland, south to s. British Columbia, Saskatchewan, Great Lakes region, and Nova Scotia, rarely and irregularly farther south to Nevada, e. Arizona (White Mts.), c. Colorado, and Nebraska. Winters chiefly from s. British Columbia to s. California, New Mexico, Texas, Arkansas, s. Illinois, Virginia, Massachusetts, Gulf states, and Florida, thence through Mexico (including Baja California) to Panama; also West Indies, Trinidad, and Margarita Island.

TEXAS: (See map.) *Winter*: Late Sept. to early May (extremes: Sept. 3, May 14). Irregularly common—formerly very common—to uncommon over eastern two-thirds; locally fairly common to scarce over western third; most numerous in northern half during spring and fall. Two summer records: Val Verde Co., near head of Devils River (2 adult males, July 21, 1902, Vernon Bailey; birds could not fly—either wounded or molting wing-quills); Travis Co., Platt sewage ponds (1 adult male, May 3–Sept. 19, 1963, Fred and Marie Webster).

HAUNTS AND HABITS: Many people, especially hunters, know the present species as Ring-billed Duck, since in both male and female the bill-ring is more conspicuous than the neck-collar—worn exclusively by the drake and evident only in good light on individuals in high plumage. In winter, the Ring-necked Duck is notably more of a freshwater bird than are its diving duck relatives. It does occur on sheltered marine waters, but chief winter quarters are lakes, marshes, ponds, and swamps near, but inland from, coasts. *Perissonetta collaris* leaves these freshwater areas in mid-spring for breeding grounds about wooded (especially coniferous) ponds and lakes, chiefly in Canada. The nest, a mass of vegetation, is placed in reeds at water's edge.

With whistling wings, the Ringneck takes off from water with greater ease than most divers; it usually alights without circling. Small groups of migrants fly swiftly and directly in open formations. They linger on swampy ponds and streams, often feeding with coots and dabbling ducks and roosting on branches of fallen trees protruding from the water. While quite capable of deep diving, even to depths of forty feet, the Ringneck prefers to forage in shallow waters for seeds, leaves, and roots of various pondweeds, bulrushes, sedges, and grasses; insects and snails comprise about one-fifth of its diet.

The seldom-heard vocalizations of the Ring-necked Duck, which resemble those of the Lesser Scaup, include the drake's purring or hissing whistle and the female's loud *scaup*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Upper parts black with metallic purplish sheen anteriorly, metallic greenish sheen posteriorly; back and scapulars olivaceous black, edges of tertials dusky olive green; tail dark hair brown; primaries between hair brown and fuscous, inner webs between hair brown and drab; upper wing-coverts chaetura drab; speculum drab gray outwardly to neutral gray inwardly; secondaries very narrowly tipped with white; throat and sides of head dull black, latter with

metallic violet or greenish sheen; tip of chin white; an indistinct bay collar on lower throat, interrupted behind; jugulum and upper breast fuscous; lower breast and abdomen white; abdomen very finely vermiculated with fuscous; sides and flanks vermiculated rather finely with white and neutral gray, except for vertical wedge on side in front of wing which is clear white; crissum fuscous black; lining of wing white, posteriorly pale gray, edge of wing and outer coverts mottled with light hair brown; axillars white. Bill plumbeous or greenish olive gray, but narrow basal and broad subterminal band bluish white, tip black; iris bright golden yellow or orange ochraceous; legs and feet dull straw yellow washed with clove brown, or light slate color, but webs of toes and claws clove brown. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female but darker; no white on sides of head; back, wings, and tail similar to winter-nuptial adult male. Bill blackish, with light gray band. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Upper parts olive brown, darker on back and pileum; rump fuscous black; back with inconspicuous buffy brown edgings; wings and tail fuscous, inner webs of primaries paler, upper wing-coverts rather grayish, verging toward hair brown; speculum neutral gray to near drab gray; feathers at base of bill and chin white or buffy white; a thin eye-ring and postocular line white; sides of head grayish brown, spotted and obscurely streaked with fuscous and olive brown; jugulum, upper breast, sides, and flanks olive brown to mummy brown edged with tawny to tawny olive and buff; middle of breast and abdomen white, more or less spotted or mottled with fuscous; abdomen and crissum fuscous or chaetura drab, former somewhat mixed with dull white; lining of wing white, outer coverts hair brown. Bill plumbeous, slate black, or olive black, transverse band cinereous, this narrower and less distinct than in male; iris dark brown, chrome yellow, gallstone yellow, or hazel; legs and feet light olive gray, slate color, or dull olive buff; claws slate black. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but pileum paler and more rufescent; chin and throat much more whitish; lower surface more mottled with brown. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to winter-nuptial adult male, but plumage duller. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial but duller; wing like juvenile; brown collar on neck barely discernible. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female but duller. *Female, first winter*: Acquired by partial postjuvenile molt. Like first nuptial female. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female. Bill black, a bar halfway between nostrils and tip dull cinereous, not always distinct; iris tawny olive; legs and feet olive gray, joints tinged with blackish slate; claws black.

MEASUREMENTS: *Adult male*: Wing, 190.0–206.0 (average, 196.8) mm.; tail, 53.1–58.4 (55.6); bill (exposed culmen), 46.0–50.5 (47.3); height of bill at base, 19.0–22.1 (20.6); tarsus, 34.5–37.6 (36.1); middle toe without claw, 53.1–57.9 (55.6). *Adult female*: Wing, 175.0–188.0 (182.9); tail, 52.1–56.9 (55.3); bill, 43.9–46.0 (45.2); height of bill, 18.0–21.1 (19.3); tarsus, 32.0–35.6 (34.3); middle toe, 51.1–55.1 (53.3).

TEXAS: *Winter*: Taken north to Archer and Cooke, east to Marion and Jefferson, south to Cameron, west to Zavala and Brewster cos.

CANVASBACK, *Aristonetta valisineria* (Wilson)

SPECIES ACCOUNT

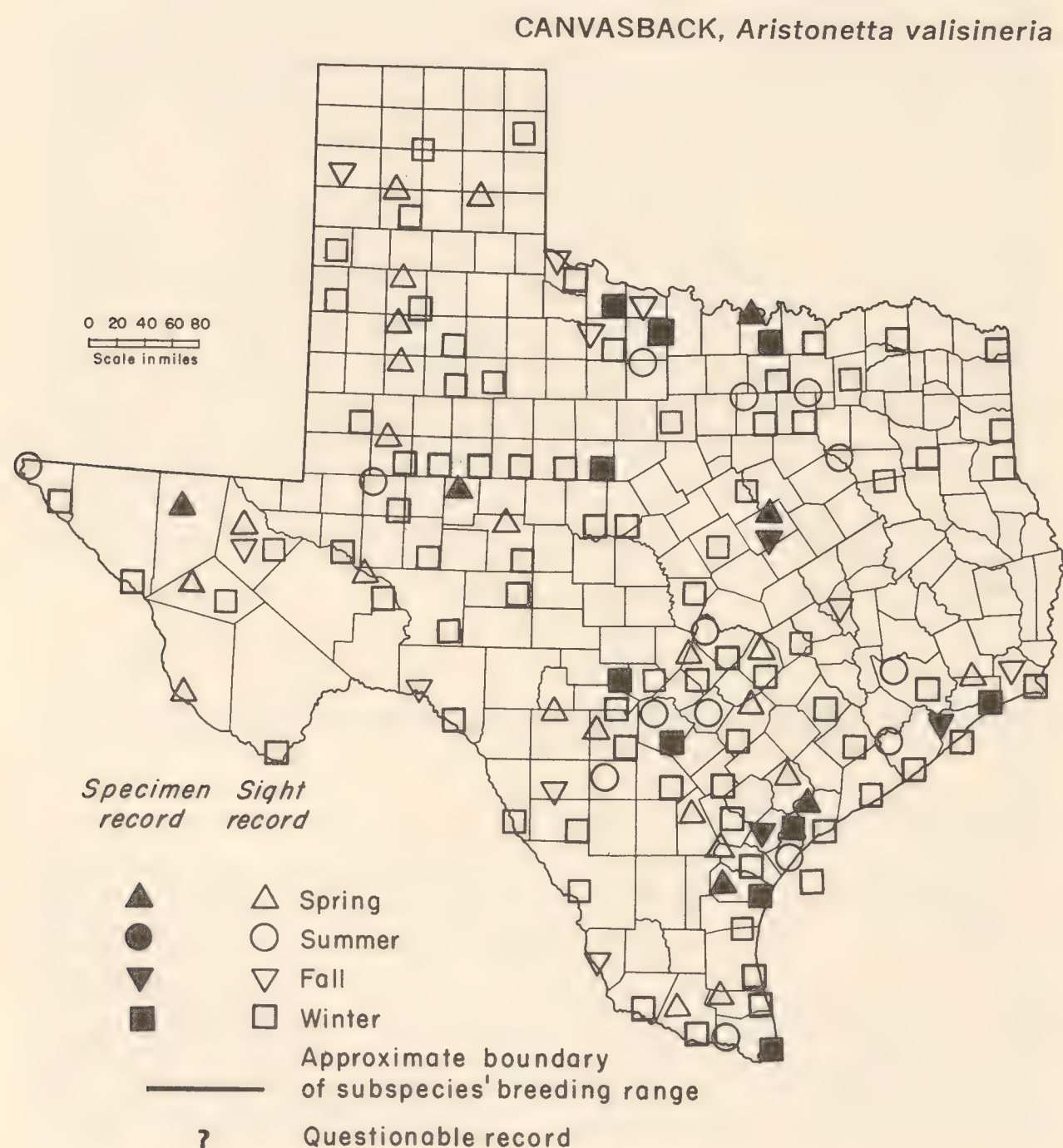
Aythya valisineria of A.O.U. check-list, 1957 (see Appendix A). The large, long-necked, "horse-headed" American bay duck; forehead slopes back gradually from long, broad-based black bill. *Male*: blackish-tinged chestnut head and neck; black chest, rump, tail, crissum; white (canvaslike) back, sides, breast, belly.

Female: whitish-mottled brownish head and neck; uniformly brown chest, tail; grayish back, sides; whitish breast, belly. Length, $21\frac{1}{4}$ in.; wingspan, $33\frac{1}{4}$; weight, $2\frac{3}{4}$ lbs.

RANGE: C. Alaska (rarely), s. Mackenzie (Great Slave Lake), and s. Manitoba, south to s. Oregon, n. Utah, n. Colorado, n.e. Illinois, and Minnesota. Winters chiefly from s. British Columbia, Colorado, Missouri, and Chesapeake Bay to Baja California, Michoacán, Veracruz, Gulf coast, and Florida.

TEXAS: (See map.) *Summer*: Casual—formerly scarce to rare—lingerer. Only definite records since 1938: Tarrant Co. (July, fide W. M. Pulich); Dallas Co. (summers of 1971 and 1972, Hazel Nichols, et al.); Travis Co. (July 4, ca. 1955, E. B. Kincaid, Jr.; female, May 11–Sept. 24, 1961, F. S. Webster, Jr.); Harris Co., Baytown (June–July, 1959, and July 30, 1960, fide S. G. Williams). *Winter*: Mid-Oct. to early May (extremes: Sept. 11, May 29). Irregularly very common—formerly sometimes abundant—to uncommon on coast; locally fairly common to uncommon elsewhere; most numerous in northern half in spring and fall.

HAUNTS AND HABITS: The exclusively North American Canvasback is a slough- and marsh-nesting duck which breeds most abundantly on the Great Plains of central Canada. Its nest is a big, well-built mass of dead reeds placed in a bed of cattails, bulrushes, or flags sprouting in shallow water. This late fall migrant stays north until frozen waters force it to move to wintering grounds, primarily on bays, lagoons, and estuaries of seacoasts. A great number of Canvasbacks make an impressive, due-east flight to the Atlantic coast, concentrating mostly on bays of Virginia and North Carolina. With the first spring thaws, *A. valisineria* returns to its summer prairie haunts.



One of the fastest flying ducks, the Canvasback migrates in large V-shaped flocks at speeds up to 60 m.p.h. Individuals rest offshore in large rafts during the day but move in close to shore to feed in early morning and evening. This adept diver forages to depths of thirty feet. About 80 percent of its diet is plant matter. Where available, the favored item is the tender roots of wildcelery (*Vallisneria*), from which the Canvasback derives its specific name; in lieu of or in addition to this it eats much arrowhead or wapato (*Sagittaria*). Consumption of both plants helps account for the excellent flavor of this much sought game bird. Leaves, stems, and seeds of wild oats, waterlily, lotus, parrotfeather, and other aquatic plants are eaten also, plus a few crustaceans, mollusks, insects and their larvae. The Canvasback secures a good deal of its food by sifting with its bill through mud.

The male Canvasback utters harsh croaking or growling notes, while the female sounds a *quack*. If she is alarmed, however, she screams a Mallard-like *curr-row*. When courting, the drake's *ick, ick, cooo* is answered by her low guttural *cuk-cuk*.

CHANGES: Like most ducks, the Canvasback is a boom-and-bust species. Also underway, however, is a long-time downward trend which carried the Canvasback to low numbers in the 1940's. Since this decade, it is perhaps recovering somewhat. In addition to drainage and pollution of its habitat, *A. valisineria* suffers, maybe more than other diving ducks, from lead poisoning. In feeding, the bird ingests seedlike spent shotgun pellets, which slowly kill it. Many thousands of ducks have died from this cause in the twentieth century, a few even in the nineteenth century. Here at last would seem to be a conservation problem with a solution. Why not make all shot pellets out of iron which would be harmless, perhaps even beneficial, when eaten? Shot not taken by ducks would gradually rust away, removing itself as trash and improving the soil a bit. Furthermore, iron would wear out shotgun barrels sooner and thus stimulate the firearms business.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial post-aestival molt. Crown and anterior part of lores fuscous black; chin fuscous, its anterior point white; remainder of head and of neck chestnut; upper back and jugulum black; mantle grayish white, very finely vermiculated with hair brown; rump and upper tail-coverts fuscous black; tail grayish hair brown; wing-quills chaetura drab, inner webs dull drab; outer wing-coverts and speculum mouse gray, inner portion neutral gray, outer wing-coverts conspicuously vermiculated with white, speculum vermiculated with white posteriorly and bordered by line formed by white tips of secondaries; breast, abdomen, and sides white, inconspicuously vermiculated with light hair brown; crissum chaetura drab; lining of wing white, mixed with smoke gray. Bill greenish black or black; iris carmine, orange, hazel, or reddish brown; legs and feet greenish slate, bluish gray, or yellowish gray, but joints darker, and webs of toes dark slate. *Adult male, eclipse*: Acquired by complete post-nuptial molt. Plumage much duller than in winter-nuptial adult male; head and neck mostly brown, black areas brownish black, feathers tipped with dull white; under surface mottled with gray and brown. Eye flecked with yellowish brown. *Adult female*,

winter and nuptial: Acquired by partial postaestival molt. Top of head sepia or bister; nape somewhat paler; lower hindneck and back dark olive brown; mantle finely vermiculated with grayish white; rump clove brown; upper tail-coverts like back and finely vermiculated with grayish; tail between hair brown and fuscous, edged with paler; wing-quills fuscous, inner webs drab; upper wing-coverts hair brown; speculum mouse gray or neutral gray; sides of head buffy brown much mixed with pale brownish white; chin and upper throat dull buffy white; jugulum dark buffy brown, edged with dull cinnamon buff; upper breast buffy brown to hair brown, feathers broadly tipped with dull white; lower breast and upper abdomen white; sides, flanks, lower abdomen, and crissum mouse gray finely vermiculated with white; lining of wing white, outer edge drab gray. Bill greenish black; iris brownish red; legs and feet gray. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to winter-nuptial adult male, but with some brown feathers in plumage of back; breast feathers with light edgings; wings duller. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial, but with more brown juvenile feathers, and whole plumage duller. Bill black; iris lemon yellow; legs and feet cinereous mottled with black, but webs of toes black; claws brownish black. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial female but somewhat duller. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but upper parts darker; lower surface more mottled with brown or gray. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male, but head somewhat less rufescent.

MEASUREMENTS: *Adult male*: Wing, 224.1–238.0 (average, 232.1) mm.; tail, 53.1–57.9 (56.1); bill (exposed culmen), 58.4–64.5 (61.2); height of bill at base, 22.1–26.9 (24.6); tarsus, 43.9–48.0 (46.0); middle toe without claw, 67.6–73.4 (71.4). *Adult female*: Wing, 216.9–229.1 (222.8); tail, 55.1–59.9 (56.6); bill, 54.1–62.0 (57.2); height of bill, 21.1–23.9 (22.9); tarsus, 41.4–45.0 (43.7); middle toe, 64.0–71.9 (67.6).

TEXAS: *Summer*: See species account. *Winter*: Taken north to Wilbarger and Cooke, east to Chambers, south to Cameron, west to Kerr and Culberson (Mar. 26) cos.

GREATER SCAUP, *Aythya marila* (Linnaeus)

SPECIES ACCOUNT

Closely resembles the Lesser Scaup (see below), but averages larger; white wing-stripe is longer—extends well onto primaries (all except 3 to 5 outer ones); head rounder; base of bill thicker; nail on bill bigger; swims lower in water. *Male*: black head and neck, glossed with green (not mostly purple); clear white (not vermiculated) sides. *Female*: best identified by longer wing-stripe. Length, 18½ in.; wingspan, 31¼; weight, 2¼ lbs.

RANGE: N. Holarctic, from Iceland, n. Scandinavia, n. Russia, n. Siberia, and Kamchatka Peninsula to n.w. North America. Winters chiefly coastally from British Isles, s. Scandinavia, c. Russia, Alaska, and Newfoundland to n. Mediterranean region, Iraq, Baluchistan, s. China, Japan, Commander and Kurile islands, s. California, U.S. Gulf coast, and Florida.

TEXAS: (See map.) *Winter*: Oct. 18 to May 20—one record in June (Denton Co., fide R. A. Rylander). Scarce to rare on coast; rare elsewhere. Probably more numerous than records indicate, but difficulty of sepa-

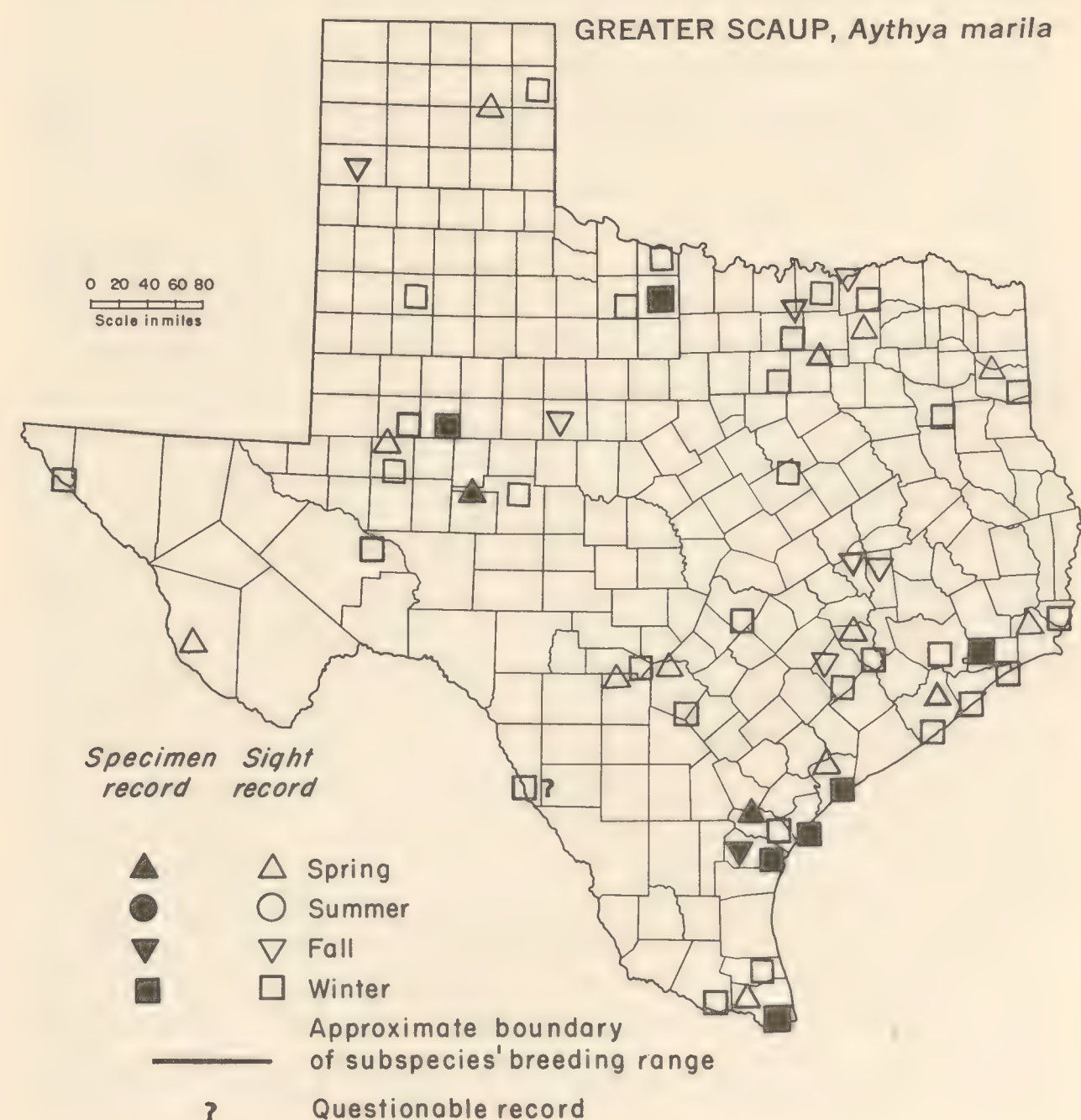
rating in field from Lesser Scaup makes status uncertain.

HAUNTS AND HABITS: Generally ranging farther north than the Lesser, the present scaup breeds about lakes and pools in moist tundra. The nest is a grass- and down-lined hollow tucked in a dense clump of vegetation. On a favorable island site, birds will nest in a colony. Ice, and finally harsh winter storms, drive the Greater Scaup to bays, harbors, and estuaries of sea-coasts. Migrants stop over on large lakes and rivers. North of Texas, birds often gather on water in huge rafts; 50,000 have been recorded in areas where food was plentiful.

Migrant Greater Scaups fly high in compact groups, with rapid rustling wing-beats. About feeding places, however, individuals rarely move more than thirty feet above the ground or water. Like most other diving ducks, it must first splash along the water's surface to build up momentum for takeoff. Sometimes, instead of forming rafts, birds float in a long line parallel to shore. This robust and strong duck maneuvers well, even in roughest waters. When foraging, it dives and remains under for twenty-five to twenty-nine seconds with eleven- to nineteen-second intervals between plunges. Various foods in its half animal-half vegetable diet include pondweeds, muskgrass, sedges, wild-rice, wildcelery, oysters, clams, scallops, mussels, crabs, numerous insects, tadpoles, and small fish.

Though generally silent, birds occasionally sound a loud *scaup scaup* or a purring *pbbrr*, the latter usually in flight. In courtship conversation, the Greater Scaup female answers the drake's gentle *pa-whoo* with a *chup-chup* or *chup-chup-cherr-err* or *tuc-tuc-turra-tuc*.

CHANGES: Records gathered by H. C. Oberholser in Texas during the first half of the twentieth century indicate that the Greater Scaup was far more numerous



then than it is today (early 1970's). It may be that climatic warming has discouraged this far-northern duck from wintering in force as far south as it used to. On the other hand, contemporary Texas bird watchers are possibly more reluctant to pronounce their hard-to-identify scaups as Greater.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN GREATER SCAUP, *Aythya marila nearctica* Stejneger

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Head, throat, hindneck, upper back, and upper breast black, somewhat brownish about base of bill; head metallic dark green in all lights; mantle finely barred and vermiculated with white; lower back, rump, and upper tail-coverts fuscous black, slightly glossy; tail dark hair brown; wing-quills fuscous, inner webs inclining to drab; middle and basal portions of outer webs of all but three or four outermost primaries lighter—between light drab and smoke gray; speculum, composed of outer webs of middle and outer secondaries, pure white tipped with chaetura black; outermost tertials slightly glossed with metallic green, shorter ones sometimes vermiculated with white; inner secondaries without distinct white spaces on outer webs; lower breast and upper abdomen white; sides and flanks white, sometimes vermiculated with hair brown; lower abdomen light hair brown vermiculated with dull white; crissum dark fuscous; lining of wing hair brown vermiculated with dull white, some posterior coverts and axillars white. Bill lilac gray, pale grayish blue, dull bluish gray, plumbeous, or blackish slate, but nail black; base of maxilla sometimes pearl gray; bare skin on chin black; inside of mouth olive gray; tongue pale flesh color; iris lemon yellow, chrome yellow, or dull greenish yellow on outer edge, shading to dull brown, then to gray next to pupil; legs and feet pale olive gray, cinereous, or bluish olive gray, but joints of toes dull black, and webs and soles of toes slate color. *Adult male, eclipse:* Acquired by complete postnuptial molt. Similar to adult female, but upper surface much more numerous vermiculated; lores and forehead entirely without white. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Upper parts olive brown; rump, crown, and nape dark sepia; anterior part of lores and forehead broadly white; feathers of back and scapulars obscurely edged with buffy brown; scapulars with some dull white vermiculations; tail hair brown; wings including wing-quills fuscous, inner webs of latter rufescent drab; upper wing-coverts dark hair brown; speculum, formed by basal portion of most of secondaries, pure white tipped broadly with dark hair brown, outer webs of innermost secondaries without distinct white areas; sides of head olive brown, bister, or sepia, indistinctly and narrowly streaked with brownish white or buffy brown; chin and throat same, former more mottled with fuscous, and anterior tip of chin pure white; breast and sides bister, drab, or hair brown, feathers all margined with brownish white or buffy brown; abdomen white; axillars and inner under wing-coverts white, but rest of latter hair brown tipped with white. Bill dull bluish gray, blackish slate, or slate black; bare skin on chin slate black; iris tawny olive, outer ring gallstone yellow or yellow ocher; legs and feet dull plumbeous, slate color, pearl gray, or dark pearl gray, but joints blackish slate, and webs of toes dull black or slate black. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but upper parts, breast, sides, and flanks lighter; posterior lower parts more or less mixed with dull brown-, buff-, or whitish-tipped feathers; lower tail-coverts darker, more brownish. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to winter-nuptial adult male, but upper parts more brownish; many retained juvenal feathers on breast, sides, flanks, and lower tail-coverts; abdomen and wings mostly juvenal. *Male, first winter:* Acquired by partial postjuvenal molt. Similar to first nuptial, but with much more juvenal plumage retained. *Female, first nup-*

tial: Acquired by partial prenuptial molt. Similar to adult female. *Female, first winter:* Acquired by partial postjuvenal molt. Much like first nuptial female. *Male, juvenal:* Acquired by complete postnatal molt. Similar to adult female, but white of face less pure and wholly or nearly absent from forehead, spotted or clouded with dark brown elsewhere; back more coarsely vermiculated with whitish; anterior lower surface lighter; wing similar to that of winter-nuptial adult male, but with fewer white vermiculations. *Female, juvenal:* Acquired by complete postnatal molt. Similar to juvenal male, but with few or no vermiculations on upper parts; anterior lower surface lighter, feathers without dark brown tips; innermost secondaries and coverts without fine white markings.

MEASUREMENTS: *Adult male:* Wing, 207.0–224.1 (average, 217.4) mm.; tail, 52.8–59.9 (56.4); bill (exposed culmen), 41.9–47.5 (43.7); height of bill at base, 19.0–22.1 (20.3); greatest width of bill, 22.1–26.9 (24.9); tarsus, 38.1–41.4 (39.9); middle toe without claw, 58.9–64.0 (62.5). *Adult female:* Wing, 202.9–218.9 (210.6); tail, 51.1–61.0 (55.9); bill, 42.4–46.0 (44.2); height of bill, 19.0–22.1 (20.3); greatest width of bill, 23.1–25.4 (24.1); tarsus, 38.0–40.0 (39.0); middle toe, 58.4–64.5 (62.0).

RANGE: W. Alaska and n. Mackenzie, south to n.w. British Columbia (rarely) and s. Mackenzie (Great Slave Lake). Winters chiefly coastally from Aleutian Islands to s. California (rarely to n. Baja California and Sinaloa), and from Nova Scotia to Florida and Texas, large numbers, formerly at least, on e. Lake Erie; also Bahamas (casually) and Cuba.

TEXAS: *Winter:* Taken north to Archer, east to Chambers, south to Nueces and Cameron, west to Howard cos.

LESSER SCAUP, *Aythya affinis* (Eyton)

SPECIES ACCOUNT

A small bay duck with slightly angular-shaped head due to elongated crest feathers; in flight, shows short white stripe on flight feathers confined to secondaries. *Male:* purple-glossed black head and neck (may show glints of green); black chest, tail, crissum; finely black-vermiculated white back and sides; white breast, belly; blue-gray bill with small black nail. *Female:* rich brown above, on chest and sides; white patch at base of bill; white breast, belly; grayish bill. Length, 16½ in.; wingspan, 28½; weight, 1¾ lbs.

RANGE: C. Alaska, n.w. Mackenzie, and n.e. Manitoba, south to s.e. British Columbia, n.e. Colorado, Nebraska, and n.e. Iowa. Winters chiefly from s. British Columbia, n.e. Colorado, Arkansas, and Massachusetts through Mexico (including Baja California) and Central America to Colombia; also West Indies and Trinidad.

TEXAS: (See map.) *Summer:* June to mid-Aug. Scarce to rare lingerer on coast (occasional flocks of 50 to 100); rare and irregular elsewhere; no indication of breeding. *Winter:* Mid-Oct. to mid-May (extremes: Sept. 26, June 23). Locally abundant to common on coast; irregularly common to fairly common elsewhere throughout; in northern half most numerous during spring and fall.

HAUNTS AND HABITS: The strictly New World Lesser Scaup is more common in interior North America than is the more northerly breeding, circumpolar Greater Scaup. *Aythya affinis* breeds across well-watered prairies of Canada and northwestern United States. Gener-

ally near a marshy creek, slough, or pond, the female incubates the clutch in a hollow in the ground, well hidden amid tall grass or reeds. Eggs of this late-breeding species usually don't hatch until early July. Rearing of ducklings, as well as the adults' period of molt, help explain the late fall passage of this species. During migration, the Lesser Scaup is the most numerous diving duck along the Mississippi Flyway. Migrants fly leisurely to their winter grounds, which stretch into northern South America. Although inland fresh waters harbor this scaup, sheltered brackish and salt bays along coasts are standard cold-month quarters.

When not migrating, this active and restless duck flies in bunches with erratic twisting-and-turning flight; transients move steadily and directly in broad fronts or strung-out lines. Foraging depths for this excellent diver average about five or six feet, though individuals swim with no difficulty to at least twenty feet. The Lesser's diet, a little more than half vegetable, includes pondweeds, seeds of grasses and sedges, muskgrass, waterlilies, other aquatic plants, mollusks, crustaceans, and insects.

The Lesser Scaup, as a rule, is quiet. On the wing, the male sometimes purrs a *pbbbr-pbbbr*, etc.; if alarmed, he sounds a discordant *scaup*. During courtship, the drake speaks in a low-toned whistle, while the female voices a purring *kwuh-h-h-h*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Like Greater Scaup, *Aythya marila*, but smaller; colors same, except head and neck have dark metallic purple or metallic violet sheen in certain lights, although in other lights these parts appear metallic dull dark green; middle and basal portions of all but four outer primaries drab on outer webs, thus darker than in Greater Scaup; in many

specimens, there appears to be rather distinct collar of light brownish streaks. Maxilla, except nail, cinereous, plumbeous, or grayish blue; rest of bill black or slate black; bare space on chin black; iris orange-yellow, chrome yellow, or gamboge yellow; legs and feet gray or olivaceous, but webs of toes black, and joints blackish slate. *Adult male, eclipse:* Acquired by complete postnuptial molt. Like adult female, but head darker and white patch at base of bill absent or barely indicated; back and scapulars more grayish. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Like adult female *A. marila* but smaller. Bill slate blue or plumbeous, nail black; iris yellow or tawny olive; legs and feet plumbeous or cinereous, but webs of toes and claws black or slate color. *Adult female, eclipse:* Acquired by complete postnuptial molt. Similar to winter-nuptial adult female, but more brownish; white areas of face partly or wholly absent. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to adult male, but upper parts more brownish; many retained juvenal feathers on breast, sides, flanks, and lower tail-coverts; abdomen and wing mostly as in juvenal. *Male, first winter:* Acquired by partial postjuvinal molt. Similar to first nuptial, but with much more juvenal plumage retained. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to adult female. *Female, first winter:* Acquired by partial postjuvinal molt. Much like first nuptial female. *Male, juvenal:* Acquired by complete postnatal molt. Much like adult female, but head, neck, and jugulum paler; white of face apparently only on lores and chin, and these white areas somewhat mixed with dark brown. Maxilla clove brown, nail seal brown; mandible vinaceous cinnamon; legs and feet greenish olive, but webs of toes clove brown; claws black. *Female, juvenal:* Acquired by complete postnatal molt. Similar to juvenal male, but lesser wing-coverts without grayish white vermiculations.

MEASUREMENTS: *Adult male:* Wing, 194.1–208.0 (average, 199.9) mm.; tail, 50.0–55.1 (53.3); bill (exposed culmen), 39.1–43.9 (41.1); height of bill at base, 17.0–20.1 (18.3); greatest width of bill, 20.1–23.9 (22.6); tarsus, 35.6–38.9 (36.8); middle toe without claw, 53.6–57.9 (55.6). *Adult female:* Wing, 190.0–198.1 (193.0); tail, 52.1–57.4 (53.8); bill, 38.1–41.1 (39.6); height of bill, 16.0–20.1 (17.8); greatest width of bill, 19.3–23.1 (20.9); tarsus, 33.8–37.6 (35.8); middle toe, 52.1–57.9 (54.8).

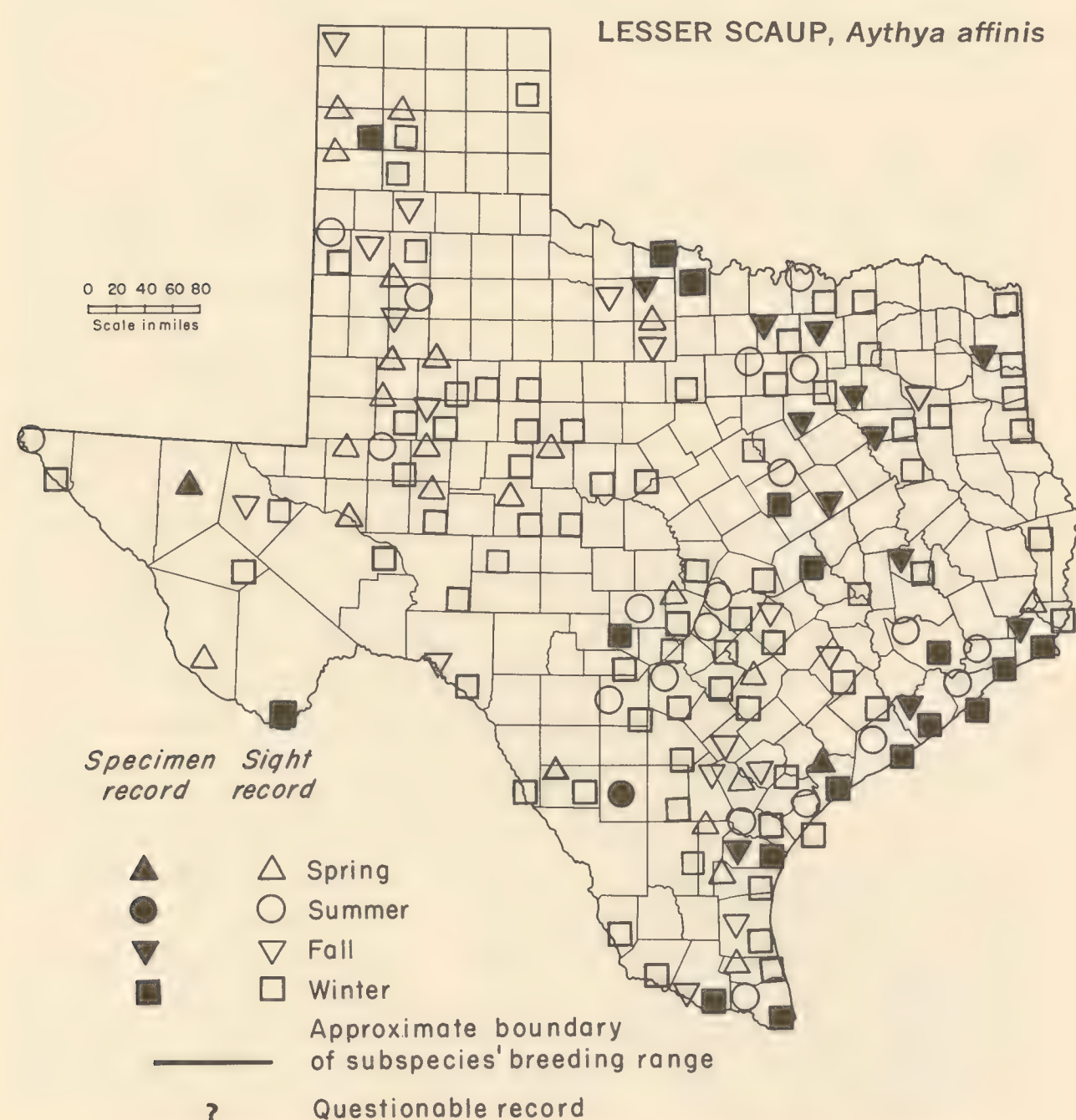
TEXAS: *Winter:* Taken north to Oldham, east to Clay, Marion (Oct. 20), and Jefferson, south to Cameron, west to Brewster and Culberson (spring) cos.

COMMON GOLDENEYE, *Glaucionetta clangula* (Linnaeus)

SPECIES ACCOUNT

Bucephala clangula of A.O.U. check-list, 1957 (see Appendix A). Appears swollen-headed (especially male) due to puffy crest; has high forehead and peaked crown; golden eyes; short blackish bill (usually yellowish-tipped in nuptial female). In flight, shows (above) white patch across most of inner wing; (below) this reduced to secondary flight feathers. *Male:* green-glossed black head; white roundish spot in front of eye; black back with numerous broad white streaks on scapulars; white neck, under parts. *Female:* rich brown head; white band on throat; dark grayish back, chest, sides, crissum; white on remaining under parts. Length, 18¼ in.; wingspan, 30; weight, 2¼ lbs.

RANGE: Rarely north of treeline, from Scandinavia, n.e. Europe, Russia, Siberia, Alaska, and s. Labrador, south to Kirghiz Steppes, Mongolia, Manchuria, British Columbia, and New Brunswick. Winters south of



frozen water to Mediterranean region, Black Sea, n. India, China, Japan, s. California, Gulf states, and Florida.

TEXAS: (See map.) *Winter*: Mid-Nov. to mid-May (extremes: Oct. 12, June 6). Irregularly fairly common locally (chiefly upper and central coasts) to rare throughout.

HAUNTS AND HABITS: The Common Goldeneye is a hardy northerner which breeds in conifer-aspen-birch lake country. Many people know the duck as Whistler—for the melodious whistling noise produced by its wings in flight. The female incubates the eight to twelve eggs in a tree hole—a natural cavity or abandoned woodpecker nest—preferably near or over water. The ducklings remain in the nest one or two days, then at the mother's beckoning quacks, they tumble out of the nest to the ground. Their descent is slowed more by air trapped in the copious down and by webbed feet than by their stubby wings. Migrants linger on large lakes and rivers throughout most of the interior United States, well into cold months. Most birds, however, seek coastal waters for a portion of the winter season; this holds true in Texas where the Goldeneye occurs most frequently on the Gulf coast.

Transients fly in small flocks, swiftly and high. In fact, rarely does the Common Goldeneye move close to the water or ground. When rising, it climbs in a few spirals before flying off. An excellent swimmer, it is accustomed to maneuvering in swift currents and is adept at dodging ice floes. When foraging in bays, inlets, and lakes, it dives mostly in shallow water from ten to twenty feet deep. Usually the bird plunges to the bottom where it overturns stones with its bill in search of animal food. The average dive is about twenty-one seconds, but individuals stay under a minute or so with

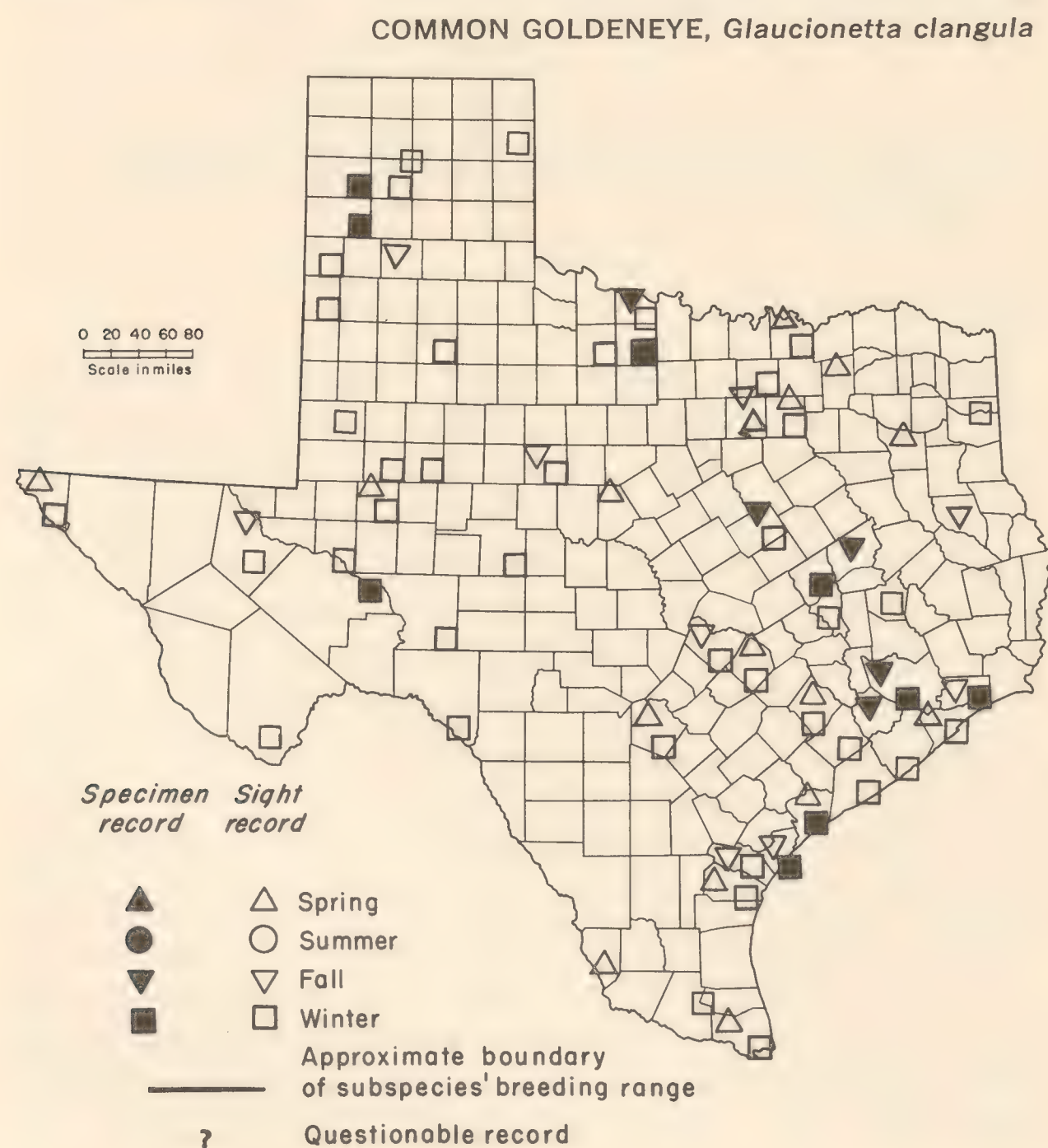
no difficulty. In fresh water, it eats aquatic insects, crayfish, and other crustaceans. On rushing inland streams, it darts about in rapids after small fish, tadpoles, and fish spawn. Crabs, mussels, and snaillike animals are consumed in salt water. During winter, after a day's feeding in a bay, Goldeneyes fly to open sea where they congregate, often in a large raft, to rest through the night.

With first signs of spring, the Goldeneye becomes quite noisy. Often by February the male has begun his spectacular neck-bending, water-spraying courtship. During this display, he sounds a rasping, double-noted *zzee-at* (also described as a nighthawklike *pee-ik*) and a flat but vibrant *paaap*; the female whistles a *peep peep*. At other times he sounds a *speer* cry; she, a low harsh *quack* and when alarmed a sharp *cur-r-rew*.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN COMMON GOLDENEYE, *Glaucionetta clangula americana* (Bonaparte)

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Head and upper throat metallic bottle green which in some lights has purplish sheen; chin fuscous black; large irregular roundish spot of pure white on lores, reaching to bill; lower hindneck white; back, rump, and upper tail-coverts black; tail dark hair brown; primaries fuscous black, inner webs fuscous, anterior lesser wing-coverts and edge of wing above chaetura black; outer secondaries, except at tips, chaetura black; inner secondaries and tertials black; scapulars black, broadly striped with white; posterior lesser coverts and other wing-coverts, with most secondaries, pure white; jugulum, sides, and rest of lower parts white; flanks chaetura drab spotted with white; long plumelike feathers of upper flanks white striped with black; sides of crissum streaked with dull black; lining of wing chaetura drab. Bill black, slate black, bluish black, or brownish black; bare space on chin slate black or black; iris lemon yellow or cadmium yellow; legs and feet capucine yellow, orange ochraceous, orange buff, or orange-yellow, but webs of toes clove brown, claws dull black, slate black, or drab. *Adult male, eclipse*: Acquired by complete postnuptial molt. Like adult female, but without white collar and with much more white in wing-coverts; head and neck paler; abdomen like that of adult male. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Head, chin, and upper throat olive brown or sepia; a white neck-collar immediately below this; hindneck drab gray slightly mottled with paler gray; remainder of upper parts deep mouse gray or deep neutral gray, rump blackish, all feathers more or less obscurely tipped with pale brown or dull white; tail between hair brown and fuscous; primaries chaetura black, edge of wing and most of lesser wing-coverts grayish hair brown, feathers margined with paler brown; speculum, formed by middle secondaries, pure white; greater and median coverts also more or less mottled with white; lower throat pale dull drab gray; jugulum dull neutral gray; sides and flanks mouse gray, all feathers margined with white or buffy white; flanks and lateral feathers of crissum mouse gray like flanks; remainder of lower parts white; lining of wing dull hair brown with paler margins. Bill slate black, olivaceous black, black, or dark brown, base drab and with yellow or deep chrome band near tip; iris white, deep chrome, or buffy yellow; legs and feet dull orange, black, or clove brown, but webs of toes straw yellow or ocher yellow; claws slate black or blackish slate. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to adult female, but without white collar on neck or white in scapulars. Nail of maxilla and tip of mandible more or less black. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to adult male, but white loreal spot not so fully developed; metallic green of



head not so well marked; white collar on neck with some brown; feathers of back margined with dark gray; wing as in juvenal. *Male, first winter*: Acquired by partial postjuvinal molt. Similar to juvenal male, but head, neck, back, scapulars, jugulum, sides of body, and flanks like those of adult female, except scapulars have only a few or no whitish tips. Bill black with light markings; iris umber brown; legs and feet dull yellow, webs of toes brown. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, but median coverts as in juvenal; scapulars tipped with dark gray; feathers of collar on neck somewhat brownish or mixed with brown. *Female, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial female, but without white collar on neck; head darker and somewhat mottled with darker brown and with indication of white loreal spot; back darker; breast with less gray. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female but larger. Bill blackish, tip of mandible flesh color; iris yellow; feet olive ochre. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male but smaller; median wing-coverts with less white, thus forming smaller light patch on wing. Bill clove brown, olive, or black, but culmen raw umber; iris maize yellow or buff, with inner ring of mummy brown or hair brown; legs and feet dark olive buff, ochraceous buff, buff yellow, or yellowish tawny olive, but joints and posterior part of tarsus broccoli brown and webs of toes clove brown, black, or slate black; claws slate black or seal brown.

MEASUREMENTS: *Adult male*: Wing, 220.0–238.0 (average, 227.8) mm.; tail, 87.6–98.1 (91.2); bill (exposed culmen), 35.1–40.4 (37.3); height of bill at base, 20.1–24.4 (21.6); tarsus, 39.1–43.4 (41.4); middle toe without claw, 60.5–65.5 (63.5). *Adult female*: Wing, 194.1–215.1 (200.4); tail, 69.6–84.1 (78.5); bill, 29.4–35.1 (33.5); height of bill, 16.3–19.6 (17.8); tarsus, 36.1–41.4 (37.8); middle toe, 55.1–58.9 (55.9).

RANGE: C. Alaska and n. Mackenzie to n.e. Manitoba and s. Labrador, south to n.w. Montana, n. New York, and Nova Scotia. Winters chiefly from e. Aleutian Islands, s. British Columbia, s. Saskatchewan, s. Ontario, and Newfoundland to n. Baja California (rarely), Texas, Gulf states, and Florida.

TEXAS: *Winter*: Taken north to Oldham and Deaf Smith, east to Wichita (Nov. 23) and Chambers, south to Aransas, west to Pecos cos.

BARROW'S GOLDENEYE, *Clanganas islandica* (Gmelin)

SPECIES ACCOUNT

Bucephala islandica of A.O.U. check-list, 1957 (see Appendix A). Closely resembles the Common Goldeneye, but bill is slightly shorter and thicker at base; crown more rounded. *Male*: told by purple (not mostly green) gloss on head; forehead perpendicular to bill; crescent-shaped (not roundish) white mark in front of eye; puffer crest at nape; white spots on black scapulars (instead of thin black lines on white scapulars). *Female*: practically indistinguishable; in direct comparison, note slightly more rounded head; white patch on inner wing restricted mainly to secondaries; and in breeding individuals, the all-yellowish (not yellowish-tipped) bill, though this is fallible. Length, 18 in.; wingspan, 28½; weight, 2 lbs.

RANGE: Mountain regions of s. Alaska, upper Yukon River, and Great Slave Lake in Mackenzie, south to Oregon, n.e. California (rarely), and n.w. Wyoming; also Labrador, s.w. Greenland, and n. and w. Iceland. Winters mainly coastally from s. Alaska to c. California; to a lesser extent, inland from s. British Columbia

and n. Montana to Utah and Colorado; also from Gulf of St. Lawrence to Maine.

TEXAS: *Winter*: Nov. 6 to Apr. 20. One collection record: Hunt Co., Greenville (1 male and 2 females taken, Nov. 6, 1958, Tom Cole; male examined and verified by F. W. Miller, director of Dallas Museum of Natural History). Sighted inland in Randall Co., Buffalo Lake (winter, fide U.S. Fish and Wildlife Service). Several careful sightings along coast: Chambers Co. (Cove, 1 on Apr. 2, 1957, and 1 immature male, Dec. 7, 1958; Cedar Point, adult male, Apr. 20, 1957, A. K. McKay); Aransas Co., Rockport (2 seen, Dec. 27, 28, 1957, Connie Hagar; 1 female, Feb. 17, 1965, M. E. and Ruth Isleib).

HAUNTS AND HABITS: Two widely disjunct breeding populations of the Barrow's Goldeneye occur. Although abundant nowhere, the species is more numerous on its western North American range, which stretches along the Continental Divide, than it is in Labrador, Greenland, and Iceland. In the West, this primarily tree-nesting duck breeds high in the Rockies, often to elevations of 10,000 feet, where it finds cavities or abandoned woodpecker holes in trees, usually near water. A rocky ledge or hole in a bank must sometimes suffice for individuals in the more sparsely wooded areas of its Atlantic range. A short migration takes the Barrow's to winter quarters along coasts; here it prefers ice-free brackish or fresh inlets, coves, or streams.

In behavior, the Barrow's is very similar to the Common Goldeneye; it is, however, said to be somewhat tamer. It rises just as clumsily from the water but underway is powerful and swift; its wings produce the musical whistle which is characteristic of goldeneye flight. In shallow water, the Barrow's plunges for fifteen to twenty seconds at a time to search among rocks for crayfish and other crustaceans, which it eats after surfacing. To obtain mollusks, eaten while the duck is submerged, it makes longer dives—fifty to fifty-five seconds—in deeper water. Feathers on its forehead are often partially rubbed off from underwater probing in rocky crevices and crannies. Along swift-moving western salmon streams, this duck eats eggs that have drifted from spawning beds, as well as the flesh of spent salmon.

Hoarse croaks are the standard vocalization of the Barrow's Goldeneye, but during the breeding season, the male utters a mewling call.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Head black with sheen of purple and a large white crescent or wedge-shaped spot in front of eye; otherwise, rather similar to the Common Goldeneye, *Glaucionetta clangula*. Bill bluish black; iris yellow; legs and feet yellow, webs of toes black. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to juvenal, with head and neck mottled with brown feathers and the white patch on side of head indistinct; wing as in nuptial adult. *Adult female, nuptial and winter*: Acquired by partial postaestival molt. Resembling adult female of *G. clangula*, but head somewhat darker, white collar a little narrower; ends of greater wing-coverts with some blackish spots. Bill orange or yellow; iris yellow;

legs and feet yellow, webs of toes dark brown. *Adult female, eclipse*: Acquired by complete postnuptial molt. Like nuptial adult female, but neck-collar mixed with gray behind; upper parts lighter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to first winter male, but with upper surface, sides, and flanks less brownish (more grayish or blackish). *Male, first winter*: Acquired by partial postjuvenile molt. Resembling juvenile male, but head and hindneck darker; foreneck less brownish (more grayish); brownish gray jugular band much more narrow. *Female, first nuptial*: Similar to eclipse female, but upper parts posterior to neck darker, more narrowly edged with gray; brownish gray jugular band darker; throat a little mixed with dull brownish white. *Female, first winter*: Similar to first nuptial female, but upper surface darker and more uniform; jugulum, sides, and flanks lighter. *Male, juvenile*: Head, throat, and cervix olive brown, pileum darker; jugulum and hindneck between buffy brown and drab; upper breast light buffy drab gray; back, rump, upper tail-coverts, and remaining upper surface fuscous black, interscapular feathers with mouse gray to hair brown edgings; scapulars and tail fuscous; wings fuscous black, inner webs of primaries fuscous, inner secondaries mostly white, and some of secondary wing-coverts more or less broadly tipped with white; breast and abdomen white; sides, flanks, and crissum mostly hair brown, longest lower tail-coverts with some white; lining of wing hair brown to chaetura drab. *Female, juvenile*: Similar to first winter female, but head, neck, jugulum, sides, and flanks lighter. Bill olive brown or dull black.

MEASUREMENTS: (From J. Delacour, 1959, *The Waterfowl of the World*, vol. 3, p. 183.) *Adult male*: Wing, 232–248 mm.; tail, 85–92; bill (exposed culmen), 31–36; tarsus, 38–42. *Adult female*: Wing, 205–224; bill, 28–31.

TEXAS: *Winter*: One collection record (see species account).

BUFFLEHEAD, *Bucephala albeola* (Linnaeus)

SPECIES ACCOUNT

Tiny plump diving duck with short bill. *Male*: big headed ("buffalo headed") due to puffy crest; green- and purple-glossed black head with broad white strap extending from eye across hind-crown to other eye; black back; white below. In flight, shows (above) large white patch on inner wing; (below) patch reduced to secondaries. *Female*: dark grayish above; oblong white patch on side of head behind eye; pale grayish below; in flight, reveals (both surfaces) small white patch on inner flight feathers. Length, 13¾ in.; wingspan, 22¾; weight, 14¾ oz.

RANGE: S. Alaska, upper Yukon River, w. Mackenzie, n.e. Manitoba, and n.w. Ontario, south to s. British Columbia and c. Manitoba, rarely in mountains of Oregon and n.e. California. Winters chiefly from Commander and Aleutian islands, s. British Columbia, Kansas, Great Lakes, and New Brunswick to California, Gulf states, and Florida, rarely to Baja California, Jalisco, State of México, and Tamaulipas.

TEXAS: (See map.) *Winter*: Early Nov. to late Apr. (extremes: Oct. 19, May 24). Locally common to scarce in western half; uncommon to rare in eastern half. One late summer specimen: Cameron Co., Brownsville (Aug., ca. 1890, F. B. Armstrong).

HAUNTS AND HABITS: Smallest and most toylike of North American diving ducks, the Bufflehead nests in deserted woodpecker cavities in trees near lakes and ponds. Chief breeding grounds are woodlands north

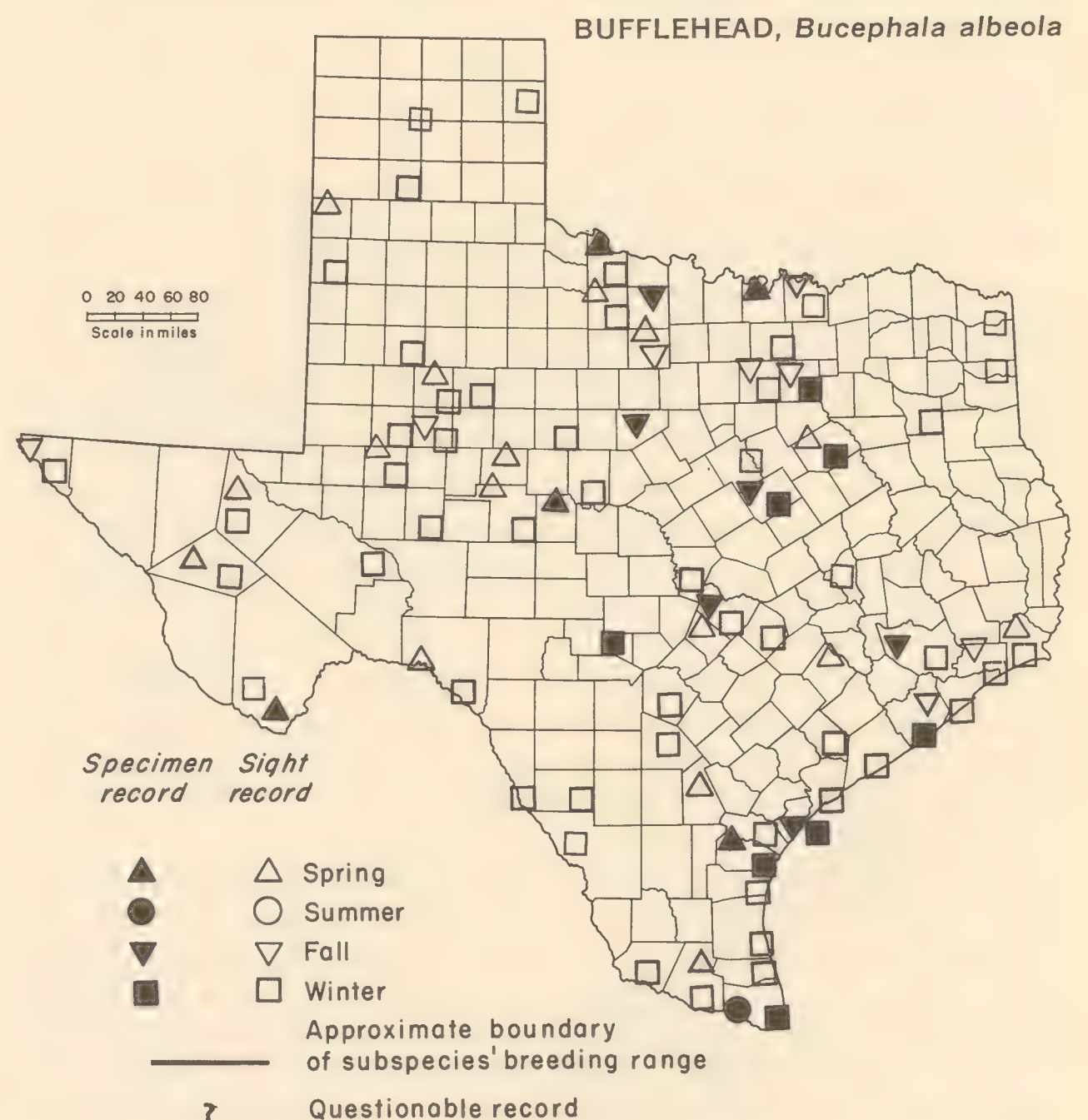
and west of the Canadian prairies. The diminutive female often squeezes through a nest hole barely more than three inches in diameter. In spring the species returns late to its summer home; however, in autumn *Bucephala albeola* reveals its hardiness by lingering well into the cold season—as long as waters are open. Northern limits for wintering Buffleheads usually coincide with the hard-frost line. Coastal tidewaters are prime winter haunts; birds also occur throughout the United States on large bodies of fresh water, but many of these individuals are very late fall migrants which eventually move to salt water.

The Bufflehead rises steeply from the water, more like a surface feeder than a diver. This little duck is a swift flier. Irregular small flocks usually fly steadily and directly at low elevations. In sandy, shallow bays, from four to fifteen feet deep, or in breakers near shore, these ducks feed in parties. Individuals take turns diving for shrimp, mussels, and other crustaceans and shellfish, while several other members stay atop, apparently as watch guards. The standard duration for a Bufflehead dive is about twenty seconds. Underwater this duck uses its feet like oars to swim and steer. In summer, freshwater amphipods, snails, fish fry, and aquatic insects are consumed; caddis fly larvae and dragonfly nymphs, especially, are fed to the young.

The Bufflehead is usually silent; even its wings do not whistle as do those of the related goldeneyes. Rarely the male utters a squeaky whistle or a single guttural rolling note, while the female sounds a hoarse quack or kuk, kuk, kuk, etc.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Forehead and lores metallic



dark green; crown and throat metallic dull dusky purple; broad white strap from eye to eye across hind-crown; remainder of head dark maroon purple; neck white; middle of back and rump glossy black; upper tail-coverts light hair brown; tail grayish hair brown; primaries chaetura black, inner webs chaetura drab; anterior lesser wing-coverts black, broadly tipped with white; edge of wing above chaetura black; remainder of lesser wing-coverts, median and greater wing-coverts, with middle secondaries, pure white; scapulars and tertials glossy black; outer scapulars mostly white; lining of wing hair brown; middle and sides of breast and sides of body white; lower abdomen and crissum smoke gray, broadly tipped with white; outer posterior coverts and axillars chaetura drab. Bill bluish plumbeous or bluish gray, but tip lighter, a little tinged with yellow, also nail and base of culmen darker, and cutting edge of maxilla dull yellow; tongue light flesh color; iris very dark vandyke brown; legs and feet pinkish white, flesh color, pinkish salmon color, lilac white, or vinaceous buff; claws black. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female, but has more white on wing and on sides of head. *Adult female, winter and nuptial*: Acquired by partial postaestival molt. Pileum clove brown, neck somewhat lighter; back chaetura drab; rump dull black; wings and tail chaetura drab, inner webs of primaries fuscous; small spot on wing, formed by subterminal or terminal portions of a few of middle secondaries, white; sides of head and of neck fuscous; oblong white spot on side of head behind eye; chin and throat light fuscous, somewhat mottled with paler brown medially; jugulum, sides of body, and abdomen light hair brown, more or less mottled by whitish tips of feathers; sides, flanks, and crissum hair brown, but feathers tipped with dull white; lining of wing white, a little spotted with hair brown, outer edge wholly of this color; axillars partly white and partly hair brown. Bill dull brownish plumbeous or slate blue; iris very dark brown; legs and feet pale lilac pink or bluish gray, but webs and joints of toes darker. *Adult female, eclipse*: Acquired by complete postnuptial molt. Essentially same as adult female. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female but larger, and with larger area of white on side of head; head and back darker, the former somewhat mottled with still darker brown. *Male, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial male, but breast with less gray, white cheek-patch less strongly indicated. *Female, first nuptial*: Acquired by partial prenuptial molt. Practically identical with adult female. *Female, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial female. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female but larger, with white patch on side of head ordinarily of greater size. *Female, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but white patch on side of face less extensive. Bill dark gray, but nail pink; iris grayish brown; feet gray.

MEASUREMENTS: *Adult male*: Wing, 165.1–173.0 (average, 168.1) mm.; tail, 69.1–75.9 (73.7); bill (exposed culmen), 25.9–29.4 (27.2); height of bill at base, 14.2–16.0 (14.7); tarsus, 33.0–34.8 (33.8); middle toe without claw, 47.0–53.1 (50.8). *Adult female*: Wing, 147.1–160.0 (151.1); tail, 59.9–69.1 (63.8); bill, 23.9–27.4 (25.7); height of bill, 13.0–15.0 (13.7); tarsus, 29.4–34.0 (31.0); middle toe, 42.9–52.1 (46.3).

TEXAS: *Winter*: Taken north to Wilbarger (Mar. 19), east to Navarro and Brazoria, south to Cameron, west to Brewster (Apr. 15) and Pecos (ca. 1862) cos.

OLDSQUAW, *Clangula hyemalis* (Linnaeus)

SPECIES ACCOUNT

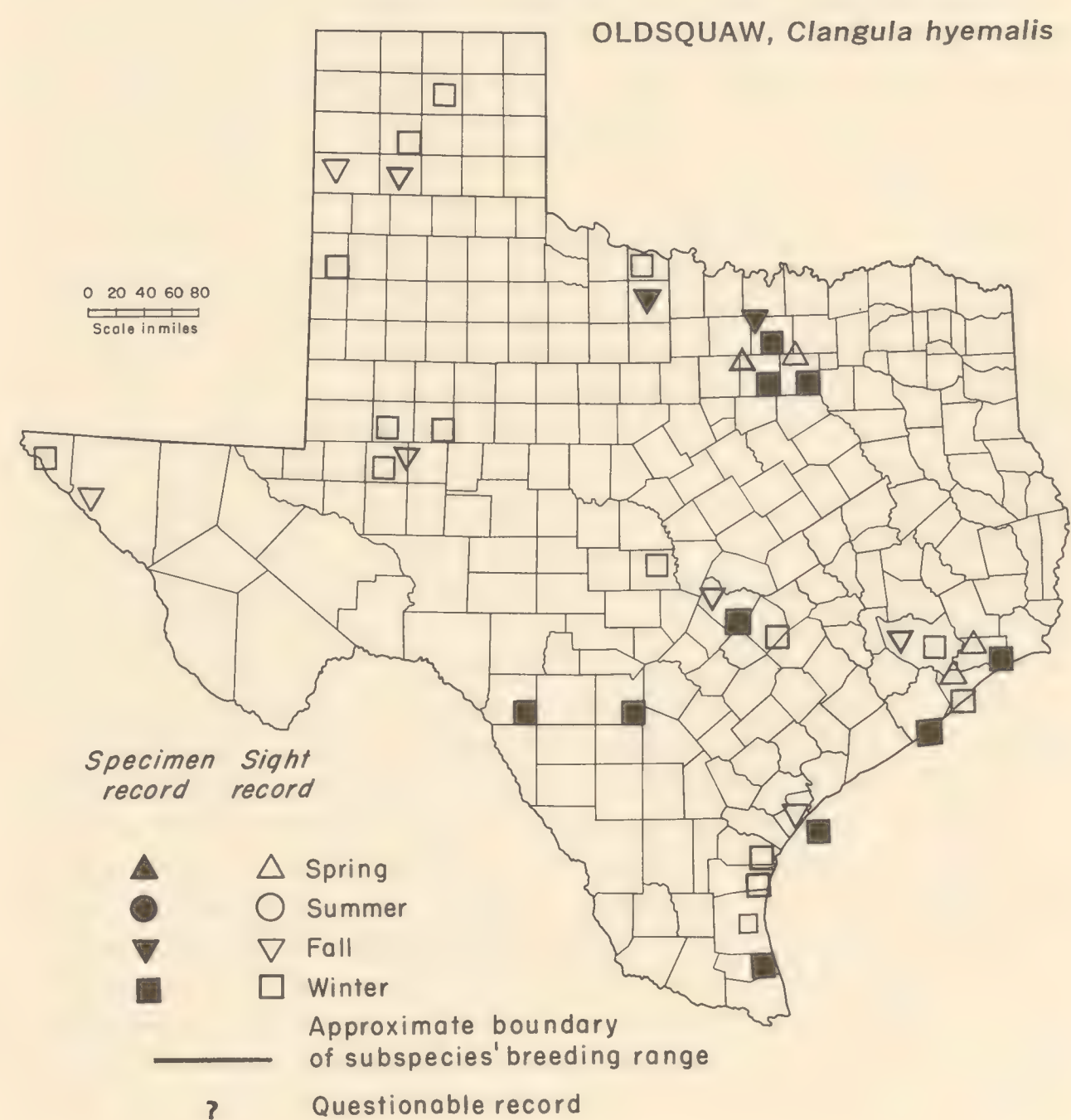
Long-tailed Duck of Old World authors. Male has distinctive, long, needlelike black tail; black bill with pinkish medial band. In flight, both sexes show all-blackish wings. *Winter male*: white head, neck, upper

back, and elongated scapular plumes; grayish around eye contiguous with large dark brown patch on side of neck; black mid-back, rump, chest; white on remaining under parts. *Nuptial male*: black head, neck, chest; large white eye-patch; reddish-tipped blackish back (including scapular plumes); white below. *Winter female*: whitish sides of head and neck with blackish crown, hindneck, and smudge on cheek; reddish-tipped blackish back; dark brownish foreneck, chest; otherwise whitish below. *Nuptial female*: crown and large cheek-patch dark grayish brown; spot at base of bill, eye-ring, and stroke behind eye white; dark grayish brown back and chest; whitish under parts. Length, 18¾ in.; wingspan, 28½; weight, 1¾ lbs.

RANGE: Circumpolar in Arctic, rare and highly local south of tundra to approximately lat. 60° N. Winters chiefly coastally south of frozen water to British Isles, Baltic and Caspian seas, Kamchatka, Kurile Islands, n. Japan, c. western California, and Chesapeake Bay; also Great Lakes.

TEXAS: (See map.) *Winter*: Oct. 19 to May 30. Rare and irregular, chiefly in northern third and on coast, though has occurred in all major regions.

HAUNTS AND HABITS: Among North American Anatidae, only the Oldsquaw and the Ruddy Duck have two separate molts—rather than the ordinary single eclipse—which produce different plumages for summer and winter. The lively gabbling Oldsquaw breeds about tundra lakes and ponds, where its nest is hollowed on the ground or in sedges, and lined with down from the mother's breast. She incubates five to seven olive buff eggs while the male remains nearby; however, just before the clutch hatches, he departs with other males for seacoasts. Egg-hunting jaegers, skuas, gulls, foxes, and people are a constant threat to this and other duck spe-



cies. The female is a tight sitter, and when she leaves the nest, she camouflages the eggs with down, grass, and debris. Very late in autumn, *Clangula hyemalis*—which means “noisy winter duck”—moves to preferred coastal wintering grounds; a few Oldsquaws spend this season on large interior lakes.

For a sea duck, the Oldsquaw takes flight easily with little or no preliminary pattering along the water's surface. When landing, however, it usually drops clumsily, with a splash. High-flying migrants move swiftly in irregular flocks. At other times, groups twist and turn erratically quite low over ground or water. Unless tightly bunched with its fellows, this active, restless bird is an exceedingly difficult target. On mild afternoons in autumn and spring, parties often spiral in the sky until lost from sight. The Oldsquaw is a superior swimmer and diver. In the Great Lakes, this deep-diving species has been caught in gill nets at depths from 50 to 180 feet. A bird ordinarily remains underwater about thirty-seven seconds. Freshwater clams, small fish, aquatic insects, and pondweeds sustain them on the breeding grounds. During winter, Oldsquaws, often abreast in long lines, forage at tide rips and offshore shoals for shrimp, crabs, and mussels. They also search in beach sand for various crustaceans and mollusks. After a day's feeding, birds usually move to sheltered bays to spend the night.

Vocal at all seasons, especially in flocks, the Oldsquaw utters many impressive, often musical calls, both on the water and in flight; these include a long series of *ow-owly*, *owly*, *owly's*, rapid *ah*, *ah*, *ah*, *ah's*, also *ong*, *ong-onk*, and a repetitive *a-leedle-a*, *a-leedle-a*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter plumage:* Acquired by partial postaestival molt from eclipse plumage. Pileum, hindneck, and upper back white; rest of back between fuscous black and clove brown; posterior upper parts black; elongated middle tail feathers fuscous black, lateral feathers white; wings plain fuscous black; inner webs of primaries between fuscous and drab; long, pointed scapulars pearl gray; speculum varying from drab to natal brown; sides of head pale dull smoke gray, darker, more brownish posteriorly; large oblong spot on sides of neck between fuscous and clove brown, bordered below by wood brown; chin, middle of throat, and jugulum white, joining white of hindneck; breast olive brown; remainder of lower parts white; lining of wing olive brown. Basal half of bill black; terminal portion orange-yellow, vinaceous rufous, or dull pink, nail slate black or bluish gray; iris carmine, bright tawny, russet, or reddish hazel; feet light plumbeous, webs of toes darker; claws black. *Adult male, nuptial:* Acquired by partial prenuptial molt. Crown, back, and middle of forehead fuscous black; occiput fuscous black with narrow white streaks; lores and cheeks dull light gray—between neutral gray and pale smoke gray; sides of forehead, superciliary stripe, and postocular region dull grayish white, somewhat mottled with brown posteriorly; rump and upper tail-coverts black; neck, throat, and breast between fuscous and olive brown; hindneck and scapulars between drab and hair brown, broadly edged with pale buff and cinnamon, longest scapulars fuscous black margined with light buff; middle tail feathers hair brown to fuscous, outer tail feathers mostly white; primaries fuscous, inner webs mostly drab; superior wing-coverts fuscous; speculum, formed by outer edges of secondaries, light hair brown; posterior lower parts white; sides and flanks smoke gray, lining of wing

dull buffy brown. Bill black, with wide middle band of pinkish orange or rose pink, nail bluish gray or black; iris usually yellowish brown, sometimes bright red, straw color, or white; feet bluish black; joints and lower side of webs of toes black. *Adult female, winter:* Acquired by partial postaestival molt. Middle of forehead brownish white; top of head fuscous black; nape dull white; lower hindneck fuscous; upper back and scapulars hair brown, feathers centrally fuscous black with broad edgings of dull cinnamon and neutral gray; feathers of rump obscurely edged with dull russet or buffy brown; middle tail feathers fuscous; rest of tail hair brown; wings fuscous black, inner webs of primaries drab, secondaries rufescent drab, and wing-coverts broadly edged with dull buffy brown; lining of wing fuscous; chin brownish drab; throat white, slightly mottled with drab; breast light hair brown with slight buffy wash; remainder of lower parts white. Bill dull black or plumbeous; iris yellow, white, or light gray; feet gray, joints and webs of toes darker. *Adult female, nuptial:* Acquired by partial prenuptial molt. Top of head and rest of upper parts chaetura black, nape chaetura drab, everywhere with some whitish or grayish edgings or other markings, particularly on occiput and scapulars; tail light hair brown or drab; wings fuscous, edged with pale buff on upper wing-coverts, inner webs of primaries drab; lining of wing dull buffy brown; throat fuscous; breast and sides of head hair brown, more or less mottled or streaked with dull white or dull brownish buff, conspicuous brownish white patch on each side of neck; remainder of lower parts white. Bill dull bluish or greenish gray; iris yellow or light brown; legs and feet greenish gray; webs darker. *Adult male, eclipse:* Acquired by partial postnuptial molt. Similar to nuptial adult male, but anterior back darker; scapulars dull brown with some edgings of lighter brown; sides and flanks drab. *Male, second eclipse:* Acquired by partial postnuptial molt. Similar to adult male in eclipse, but with middle pair of tail feathers decidedly shorter. *Male, second winter and nuptial:* Acquired by partial postaestival molt. Similar to adult male in corresponding plumage, but middle pair of tail feathers decidedly shorter. *Male, first eclipse:* Acquired by partial postnuptial molt. Similar to male in second eclipse, but feathers of body with less of dark brown; most of lower surface much like that of juvenal. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to second nuptial male, but with many retained juvenal feathers throughout; scapulars shorter and sometimes darker; sides of head often with dark brown feathers; some blackish feathers in white of throat and breast; wings, tail, and most of lower surface like those of juvenal. Bill black, but spotted with tawny along culmen; iris ocher yellow; legs and feet orange ochraceous, but webs of toes clove brown; claws drab. *Male, first winter:* Acquired by partial postjuvinal molt. Similar to adult male in winter, but with many juvenal feathers retained. *Female, second eclipse:* Acquired by complete, though greatly protracted, postnuptial molt. Similar to nuptial adult female, but feathers of upper back partly pale gray, tipped with cinnamon buff; scapulars with grayish edges. *Female, second winter and nuptial:* Acquired by partial postaestival molt. Similar to female in second eclipse. *Female, first eclipse:* Acquired by complete, though greatly protracted, postnuptial molt. Similar to female in second eclipse but duller; back and scapulars darker, with relatively few buff edgings. *Female, first winter and nuptial:* Acquired by partial postjuvinal molt. Similar to juvenal, but scapulars with broad gray margins. *Juvenal:* Acquired by complete postnatal molt. Similar to adult female, but upper parts more uniform without cinnamon or russet edgings; sides of head, chin, throat, and jugulum light hair brown or drab gray. Bill bluish gray; legs and feet pale gray with dull black webs; iris dark brown.

MEASUREMENTS: *Adult male:* Wing, 215.1–231.9 (average, 220.2) mm.; tail, 182.1–262.1 (215.4); bill (exposed culmen), 26.4–29.9 (27.7); height of bill at base, 15.0–17.5 (16.5); tarsus, 34.8–38.9 (37.1); middle toe without claw, 45.5–52.1 (48.8). *Adult female:* Wing, 186.9–212.1 (201.9); tail, 57.9–71.9 (66.3); bill, 24.9–27.9 (26.7); height of bill, 13.0–16.0 (14.7); tarsus, 33.0–36.1 (34.0); middle toe, 44.4–49.0 (46.8).

TEXAS: *Winter:* Taken north to Archer (Nov. 27) and Den-

ton, east to Chambers, south to Refugio, Willacy, and Cameron, west to Medina and Kinney cos.

[**HARLEQUIN DUCK**, *Histrionicus histrionicus* (Linnaeus)]

A small sea duck with a short bill; high forehead; longish, pointed tail. *Male*: mainly blue-black, but marked with harlequin pattern of white stripes and spots (most prominent: crescent between bill and eye, ear-spot, narrow neck-collar, diagonal stripe on side of chest, and longitudinal scapular-stripe); chestnut sides. *Female*: largely blackish brown with three white spots on side of head; pale grayish breast. Length, 16¾ in.; wingspan, 21; weight, 1¼ lbs.

RANGE: Siberia (east of Lena River) and n. Kamchatka, south to n. Mongolia, Manchuria, Kurile and Commander islands, thence to Aleutians, c. western Alaska, and w. Mackenzie (Mackenzie River delta and Great Slave Lake), south to c. California (w. slope of Sierra Nevada) and n.w. Wyoming; also from Hudson Strait region, s.e. Baffin Island, and Labrador to s. Greenland and Iceland. Winters chiefly coastally from Manchuria, Kamchatka, Aleutians, and Alaska Peninsula to Korea, c. Japan, and c. western California; in s. Greenland and Iceland, and from s. Labrador to Massachusetts.

TEXAS: Hypothetical: Three sightings in Aransas Co., none substantiated by photographs: causeway over junction of Copano and Aransas bays (male and female with 12 Common Goldeneyes, Jan. 14, 1945, Connie Hagar; studied at close range in bright light most of afternoon); Aransas Nat. Wildlife Refuge (male seen, Jan. 29, 1945, Ralph Friedmann, Edward Fleischer); northwest shore of Copano Bay (2 males and 1 female, Nov. 16, 1964, R. P. Jones, Tom More, Jim Palmer).]

[**KING EIDER**, *Somateria spectabilis* (Linnaeus)]

A big stocky sea duck. *Male*: large, high, yellow-orange frontal shield at base of short orange bill; bluish crown, nape; greenish cheeks; white neck, upper back, and chest, the latter with pale pinkish tinge; black hind parts, except for white flank-patch; in flight, shows (above) white patch on fore-edge of inner wing. *Female*: gray bill and rudimentary shield; plumage uniformly rich brown, generously streaked and tipped with blackish above and on sides. Length, 22 in.; wingspan, 36; weight, 4 lbs.

RANGE: Arctic coasts and islands from Russia and Siberia to Alaska, Canada, and n. Greenland. Winters chiefly coastally, south of frozen water, to Iceland, n. Scandinavia, Denmark, Kamchatka, Kurile Islands, Aleutians, British Columbia, Gulf of St. Lawrence, Massachusetts, and s. Greenland.

TEXAS: Hypothetical: One careful sighting: Aransas Co., Rockport beach (male in breeding plumage, Oct. 23, 1968, Dr. Leonard Goldman, Connie Hagar). Bird was sitting on beach when sighted and allowed ap-

proach to within a few feet before sliding into water.]

WHITE-WINGED SCOTER, *Melanitta deglandi* (Bonaparte)

SPECIES ACCOUNT

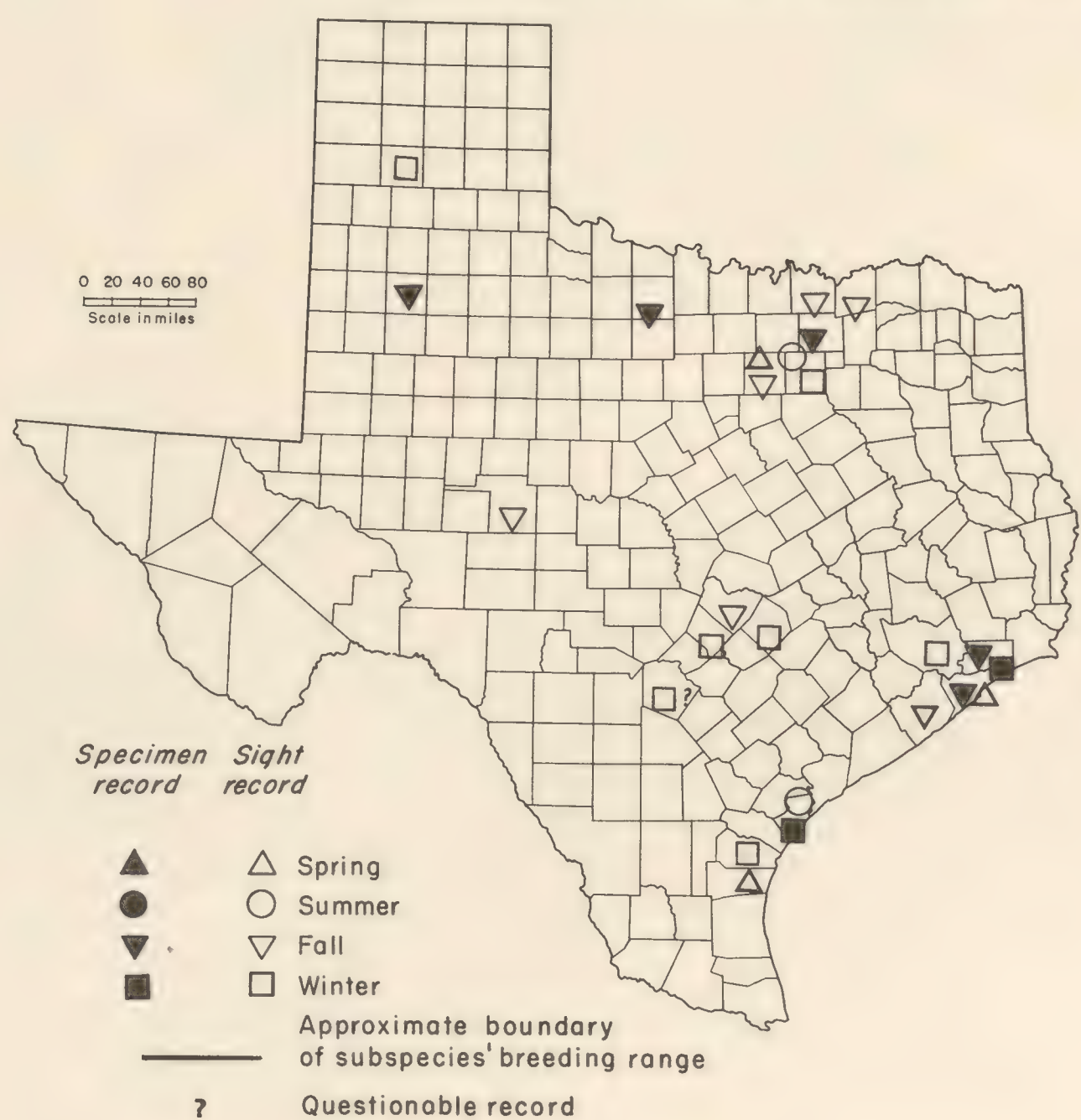
Often regarded as conspecific with Eurasian Velvet Scoter, *Melanitta fusca*. A large, thickset, big-headed diving duck; in flight, reveals conspicuous white patch on trailing edge of inner wing (both surfaces). *Male*: essentially black with tiny crescent-shaped white patch around and behind white eye; heavy orange bill with black knob at base. *Female*: blackish brown with two obscure whitish face marks (one in front of eye, other in ear region); blackish bill with smaller protuberance. Length, 21½ in.; wingspan, 3¼ ft.; weight, 3½ lbs.

RANGE: Upper Yukon River of Alaska and Mackenzie River delta, south to c. British Columbia, s.e. Alberta, n. North Dakota, and s. Manitoba. Winters chiefly coastally from e. Aleutians to Baja California, and from Newfoundland to North Carolina, rarely to Florida and Gulf states; also Great Lakes.

TEXAS: (See map.) *Winter*: Aug. 23 to Apr. 28. Rare (at least 30 records) and irregular, chiefly on upper and central coasts, though has occurred in Hays, Bastrop, Travis, Tom Green, Dallas, Tarrant, Collin, Fannin, Grayson, Archer, Lubbock, and Randall cos. (see detailed account).

HAUNTS AND HABITS: The White-winged, largest North American scoter, is more numerous inland than its relatives, the Surf and American. In interior northwestern North America, it breeds upon tundra as well as on more southerly plains and prairies. At this

WHITE-WINGED SCOTER, *Melanitta deglandi*





Melanitta deglandi

White-winged Scoter, *Melanitta deglandi*
male (foreground), immature (right)

season, pairs live near lakes, streams, ponds, and sloughs; the nest is a scrape on the ground, well hidden under bushes and lined with sticks, leaves, debris, and down. Overland migrants stop to rest on large lakes and rivers as they move to seacoasts for the winter; occasionally a few straggle as far south as Texas. On off-shore shoals and big bays and sounds, *Melanitta deglandi* is found singly, in pairs, or in flocks; often it mingles with its scoter relatives and various other sea ducks, particularly the Oldsquaw.

The Whitewing's flight is strong and direct. Migrating flocks pass, weather permitting, high in the air, in various formations from irregular masses to V-shapes and long lines. When going shorter distances, birds move close to the ground or water, and, at such times, flight appears heavier and somewhat labored. To take off, like many other diving ducks, it must patter along the surface until it is able to get fully airborne. On breeding lakes and ponds, birds forage for freshwater shellfish, crayfish, and aquatic insects; they also eat small amounts of various pondweeds. In winter, the Whitewing dives twenty, sometimes forty, feet to shellfish beds, where it obtains mussels, clams, oysters, scallops, and whelks. An elastic stomach, powerful gizzard, and strong digestive juices allow the scoter to digest quantities of shellfish, some 2½ inches long.

Afloat, the White-winged Scoter is silent. A low, bell-like whistle which issues in flight is possibly produced by the bird's wings. Sometimes individuals sound a short croak while flying.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN WHITE-WINGED SCOTER, *Melanitta deglandi deglandi* (Bonaparte)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts black; head and neck with slight violet sheen, back and wings with greenish sheen; forehead fuscous to fuscous black; tail chaetura black; exposed surface of wing-quills chaetura black, inner webs of quills fuscous, secondaries, except innermost, white, forming large wing-patch; sides of head and of neck dusky slate violet; small crescentic spot below eye white; chin and throat fuscous black, chin somewhat paler; jugulum black, like upper surface; breast, abdomen, and crissum fuscous black; sides and flanks fuscous; lining of wings fuscous black, posteriorly hair brown, middle portion varied with white. Base of bill and cutting edges black; nail of maxilla and tip of mandible ochraceous rufous or vermilion; space below nostrils on maxilla salmon color; from this to cutting edges, also base of nail of mandible, rose pink, dragon blood red, or orange; middle of bill white; iris yellowish white, clay color, pale bluish gray, or white; legs and outer two toes scarlet or pinkish vinaceous externally, but internally rufous or orange vermilion, webs of toes black, joints of toes dull black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by partial prenuptial molt. Middle of crown and forehead fuscous; remainder of crown fuscous black; two vague whitish face marks—one in front of eye, other in auricular region; rest of upper surface fuscous; tail fuscous black or chaetura black; exposed surface of wing-quills fuscous black, inner webs fuscous; secondaries mostly white, forming large patch on wing; lining of wing fuscous, posteriorly hair brown, centrally varied with dull white and light drab; sides of head and of neck, chin, and throat fuscous black, speckled or finely streaked with brownish white or light fuscous; remainder of lower surface fuscous, middle of breast varied

slightly with brownish white. Maxilla slate black, nail clove brown; mandible seal brown; iris bistre or yellow; legs and feet hazel or reddish chocolate, but webs of toes black; claws slate black. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, except lower parts more brownish. Knob on bill somewhat less well developed. *Male, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to second nuptial, but with much mixture of brown juvenal feathers both above and below. Knob on bill less well developed. *Male, first winter:* Acquired by partial prenuptial molt. Similar to first nuptial male. *Female, second nuptial:* Acquired by partial prenuptial molt. Like nuptial adult female, but bill brownish black, nail of mandible tipped with dull ochraceous orange; legs and feet russet, but webs of toes and claws black. *Female, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to second nuptial female, but with white marks below eye much obscured by blackish tips of feathers; some scattered adult feathers on upper surface and on some parts of lower surface; otherwise retains juvenal plumage. Bill blackish slate, tipped with dull white; legs and feet slate color; claws slate black. *Female, first winter:* Acquired by partial postjuvenal molt. Similar to first nuptial female, but with still more juvenal feathers, and other feathers not so badly worn. *Juvenal:* Acquired by complete postnatal molt. Similar to adult female, but with two obviously paler spots on side of head—one on lores, other on auriculars—somewhat mixed with fuscous black; throat paler; breast and upper abdomen much mixed with dull white.

MEASUREMENTS: *Adult male:* Wing, 271.0–285.0 (average, 275.9) mm.; tail, 75.9–84.1 (81.3); bill (exposed culmen), 36.6–46.0 (40.1); height of bill at base, 20.6–24.9 (23.1); tarsus, 49.5–55.6 (52.3); middle toe without claw, 71.1–77.5 (74.2). *Adult female:* Wing, 246.1–260.1 (252.2); tail, 70.1–80.0 (74.7); bill, 32.0–39.1 (37.1); height of bill, 15.5–19.6 (18.3); tarsus, 46.0–50.5 (48.3); middle toe, 65.0–71.9 (68.3).

RANGE: Identical with that of species with exception of Alaska.

TEXAS: *Winter:* Six specimens: Lubbock Co. (fall 1967, J. D. Rollo); Archer Co. (Nov. 5, 1955, W. W. Dalquest; Midwestern University collection, no. 17791); Collin Co., Gunter (Oct. 27, 1934, W. B. Miller); Dallas Co., Bachman Lake (1927, W. A. Mayer); Galveston Co., Galveston (Nov. 1, 1890; Tulane University collection); Aransas Co., Lamar, near Mills Wharf (immature male, Dec. 30, 1940, J. Saunders). Additional records (specimens?): Dallas Co., near Dallas (5 obtained since 1920, fide W. A. Mayer); Chambers Co., near Cove (1 killed, ca. Nov. 11, 1950, and 1 found dead, Dec. 9, 1951, A. K. McKay).

SURF SCOTER, *Pelionetta perspicillata* (Linnaeus)

SPECIES ACCOUNT

Melanitta perspicillata of A.O.U. check-list, 1957 (see Appendix A). A large, heavy-bodied, big-headed diving duck; in flight, both wing surfaces uniformly dark. *Male:* black above and below with white patch on forehead, another on nape; large parti-colored (reddish, yellow, black, and white) bill, swollen at base; white eyes. *Female:* mainly sooty gray with black crown; vague whitish nape-patch and two face-patches (one in ear region, other between bill and eye); greenish black bill. Length, 19 in.; wingspan, 34¼; weight, 2¼ lbs.

RANGE: N.e. Alaska and w. Mackenzie. Winters mainly coastally from e. Aleutians to Baja California; to a lesser extent, from Bay of Fundy to North Carolina,

rarely to Florida and Gulf states; also Great Lakes (a few).

TEXAS: (See map.) *Winter*: Oct. 16 to May 16. Rare (at least 30 records) and irregular, chiefly on coast, though has occurred in Bexar, Travis, Polk, Midland, Dallas, Smith, Archer, Randall, Potter, and Ochiltree cos.

HAUNTS AND HABITS: Far from ocean breakers, for which it is named, the Surf Scoter breeds about tundra lakes, ponds, and marshes, chiefly in far northwestern Canada. The well-hidden nest is hollowed in tall grass or placed under bushes near water. This down-lined cup of dead leaves and weeds holds usually seven very pale buff eggs. Adults, generally preceding young birds by about two weeks, move to coastal winter waters along the Atlantic and Pacific; rarely does this sea duck occur inland during the cold season.

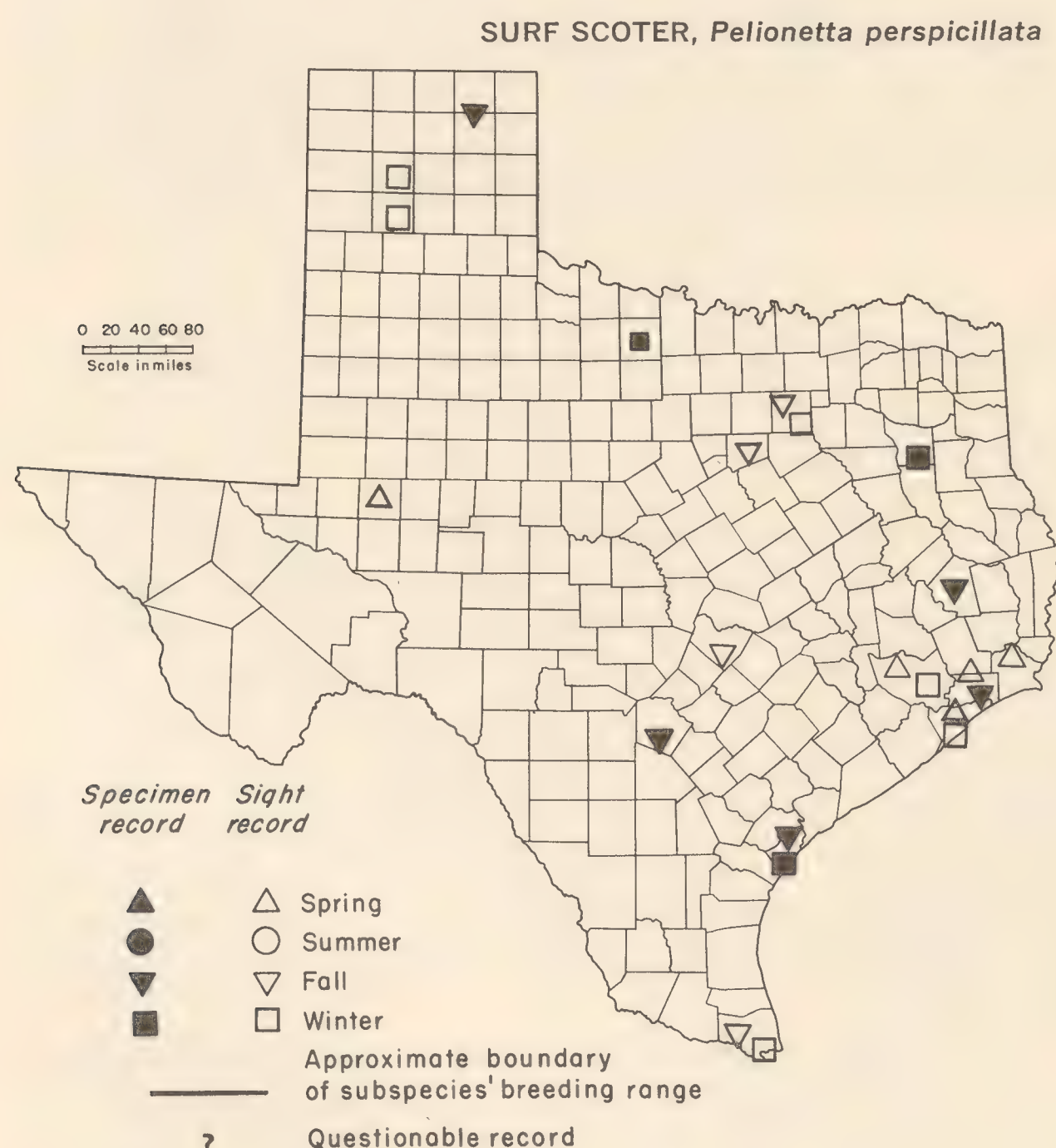
In flight, the present species is very similar to, and often indistinguishable from, the other scoters, especially the dark-winged American. Characteristic of diving ducks, takeoff is labored, but flight becomes strong and swift once the bird is airborne. Large or small flocks in lines, V-formations, or randomly grouped bunches tend to follow coastlines; at times they take shortcuts across capes or points. A party of scoters sometimes appears bewildered on approaching land; birds will fly one way, then another, or turn back and alight on the water before deciding whether to fly overland or along the shore. During summer, aquatic insects are the chief food, especially for immatures, but individuals eat crayfish, fish spawn, pondweeds, and eelgrass as well. In winter, a foraging bird dives with ease into the bases of cresting waves in search of mollusks. As it swims in and beyond the surf, the scoter holds its secondaries out stiffly, but bends the primaries

over its back and tail. Individuals also probe for food in sand or join other scoter species in large tidal ponds and passes on upper beaches where mussels and other marine life concentrate.

The Surf Scoter rarely vocalizes. Low throaty croaks and clucks are uttered infrequently. During the breeding season, individuals may sound a low clear whistle.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Upper parts black with slight greenish gloss; crown with large roundish spot of creamy white; hind-neck with long triangular spot of same color; tail and exposed surface of primaries chaetura black, inner webs of latter light fuscous; sides of head and of neck, chin, and throat fuscous black, lighter on mid-throat; posterior lower parts chaetura drab; lining of wing mostly fuscous, but becoming chaetura black on edge of wing. Bill chiefly orange-red or orange, darker above nostrils, swollen base of maxilla with large spot of black, a whitish area in front of this extending as far as nostrils, nail of maxilla dull orange rufous, maize yellow, or gray; mandible flesh color, but its nail dull orange rufous; iris white or yellowish white; outer side of legs, hind toe, and outer and middle toes madder brown or pinkish geranium red, inner side orange vermillion or cadmium orange, but webs of toes and joints black or dull green; claws black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by partial prenuptial molt. Pileum and middle of hindneck fuscous black, remainder of hindneck olive brown to fuscous; rest of upper surface fuscous, with light brownish tips on feathers; tail hair brown to fuscous; sides of head and of neck dull buffy brown or light fuscous, streaked and mottled with fuscous black and fuscous; slightly lighter area below and in front of eye, another on ear-coverts (sometimes scarcely observable), sometimes appearing dull brownish or brownish white, much overlaid with fuscous; wings fuscous to fuscous black, with hair brown or pale brown edgings; throat dull buffy brown or lighter; jugulum olive brown; breast and abdomen light fuscous or hair brown; lining of wing fuscous. Maxilla black or greenish black, with scarcely noticeable large black spot on each side at base, but nail light flesh color or dull yellow; mandible blackish brown or light flesh color, nail mottled sometimes with dull yellow; iris raw umber or reddish brown; legs and feet on inner side yellowish orange, dull orange rufous, russet, or burnt sienna, but dark hair brown on outer side; webs of toes brownish gray or black; claws black. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male, second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but lower surface more brownish. *Male, second winter*: Acquired by complete postnuptial molt. Like second nuptial male. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to second nuptial male, but with some brownish feathers still remaining, including wings of juvenal, portions of back, and median under surface, which become much faded and bleached; crown without white. Protuberances of basal portion of bill not so well developed. *Male, first winter*: Acquired by partial postjuvenal molt. Similar to juvenal male, but with many black feathers both above and below. Bill somewhat more swollen basally; culmen natal brown, bordered with dull salmon color mixed with rufous, nail black; mandible pallid neutral gray, mottled at tip of nail with black and dull tawny; iris white; legs and outer side of outer toes bay; inner side of legs hazel; toes mostly ferruginous; webs of toes and claws black. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female, but with at least feathers of breast, part of back, and wings of juvenal still retained. *Female, first winter*: Acquired by partial postjuvenal molt. Much like first nuptial female, but with still more persisting juvenal feathers. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female, but with two large brownish white spots on auriculars; abdomen and breast lighter, sometimes brownish



white or very pale drab, edged with brownish white. Iris dark brown; legs and feet dull orange and black or blackish brown.

MEASUREMENTS: *Adult male:* Wing, 231.9–244.1 (average, 237.2) mm.; tail, 70.1–86.1 (80.2); bill (exposed culmen), 41.9–47.5 (44.2); height of bill at base, 21.1–23.6 (22.4); tarsus, 41.9–47.3 (44.2); middle toe without claw, 61.5–68.6 (64.8). *Adult female:* Wing, 210.1–235.0 (219.7); tail, 61.5–77.7 (73.7); bill, 36.1–39.9 (38.1); height of bill, 17.5–20.1 (18.8); tarsus, 39.9–45.0 (42.7); middle toe, 56.9–68.1 (60.7).

TEXAS: *Winter:* Two specimens: Archer Co. (Dec. 22, 1963, W. W. Dalquest; Midwestern University collection, no. 19334); Polk Co., Lake Livingston (female, Nov. 7, 1970, S. M. Orenbaun; examined by C. D. Fisher). Additional records (specimens?): Ochiltree Co., Fryer Lake, south of Perryton (found in hunter's bag, Nov. 19, 1943, fide L. W. Triplet); Chambers Co., Cove (killed, Nov. 11, 1950, fide A. K. McKay); Aransas Co., Rockport (shot, Nov. 4, 1942, I. R. Sorenson; another taken by hunter, Dec., 1947); Bexar Co., San Antonio (2 shot, Nov. 23, 1957, R. Duncan).

AMERICAN SCOTER, *Oidemia americana* Swainson

SPECIES ACCOUNT

Considered conspecific with Common Scoter, *Oidemia nigra*, by A.O.U. check-list, 1957 (see Appendix A); Black Scoter of some authors. A small- and round-headed scoter with a longish, pointed tail (sometimes cocked). *Male:* only all-black-plumaged North American duck; yellow-orange knob on black bill. *Female:* mainly dark brown with whitish sides of head and throat; pale brownish breast; blackish bill (lacks protuberance). Length, 19¼ in.; wingspan, 32¾; weight, 2¼ lbs.

RANGE: N.e. Siberia and w. and s. Alaska, and in summer (breeding?) across Canadian Arctic to Labrador and Newfoundland. Winters chiefly coastally from

Kurile and Commander islands to e. China, from Pribilof and Aleutian islands to s. California, and from Newfoundland to South Carolina (very rarely to Florida and Gulf states); also Great Lakes (a few).

TEXAS: (See map.) *Winter:* Nov. 4 to Apr. 21. Rare (at least 21 records) and irregular, chiefly on coast, though has occurred in Medina Co. (see detailed account); Bexar Co., San Antonio (1 seen, Dec. 27, 1964, Mr. and Mrs. G. B. Harding); Dallas Co., Dallas (4 separate sightings, 1966–68); Randall Co., Buffalo Lake (fall, fide U.S. Fish and Wildlife Service); and Deaf Smith Co. (Dec., 1939, H. F. Saunders).

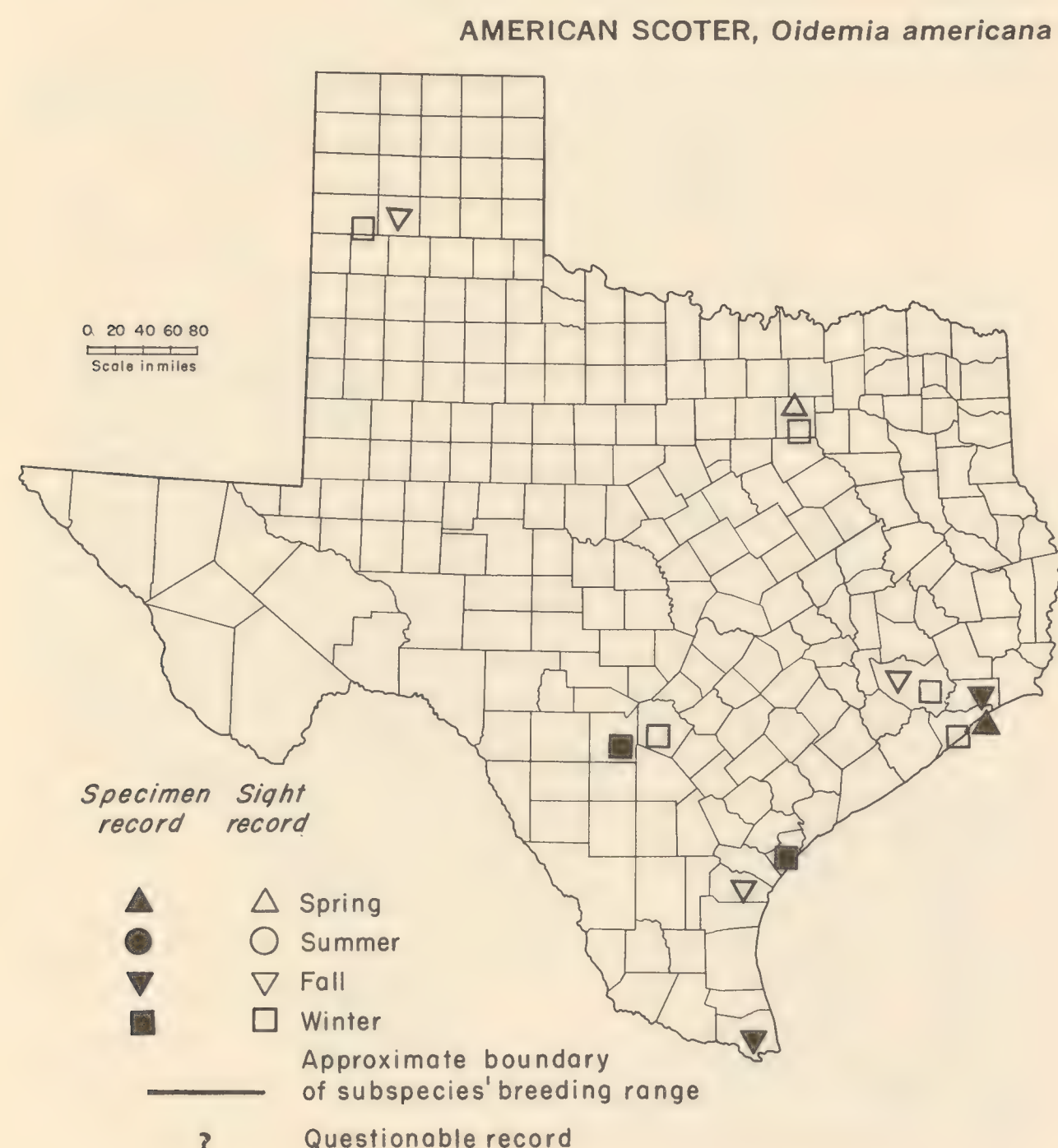
HAUNTS AND HABITS: Deep freshwater lakes and pools in coniferous forests, mountainous or coastal tundra, and wooded coastal inlets are standard breeding haunts for the American Scoter. Its down- and grass-lined nest, placed between boulders or concealed under bushes, is usually safe from human intrusions. Early in September—as a rule, well before its other scoter relatives—this species begins appearing along the Atlantic and Pacific coasts of the United States; also it is the last scoter to leave its winter quarters in spring. Unlike the Eurasian Common Scoter, the present species is not very plentiful; it is, in fact, the least numerous of the New World scoters. Largest concentrations during cool months are to be expected along the coast of New Jersey and Maryland. This scoter rarely appears in the interior; even in storms, birds hug water near shoreline.

The swift flight of the American is basically similar to that of its cousins, particularly the Surf Scoter, but *O. americana* rises from the water with more ease. It also appears more active and a bit lighter on the wing than the White-winged Scoter. In fair weather, migrants are high fliers. Transient flocks vary in form and size from unorganized bunches or straggling lines to U- or V-shaped companies. In flight, a whistling sound is produced by the wings. This active and tireless swimmer and diver feeds chiefly about rocky points, ledges, and reefs, where it forages for barnacles and limpets; other items in its diet include oysters, clams, mussels, shrimp, fishes, rarely a bit of pondweed.

The male's call, exceptionally musical for a duck, is a bell-like *who-oo-hoo* or *cour-loo*, somewhat suggestive of the cry of a Long-billed Curlew. The female's vocalization is a hoarse croak or growl. The American Scoter is, however, largely silent.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Upper surface, with sides of head and of neck, black, a little brownish, but with slight metallic bluish, greenish, or purplish sheen; tail fuscous to fuscous black; tips and outer webs of primaries and secondaries fuscous black; inner webs of primaries (except tips) dull wood brown to dull avellaneous, paling to tulle buff at base; inner webs of secondaries (except tips) fuscous to light fuscous; upper wing-coverts and scapulars fuscous black; lower parts fuscous black to fuscous with slight metallic sheen; lining of wing fuscous. Bill black, except basal portion of maxilla to beyond nostrils (excepting stripe along tomium) which is yellow or orange, deepest laterally; iris dark brown; legs and feet



brownish black, webs between toes black. *Adult male, eclipse*: Not yet detected; probably none. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by partial prenuptial molt from winter. Upper surface olive brown to clove brown, tips of feathers often lighter, particularly when worn; wings like upper surface, but inner webs of wing-quills (except tips) buffy brown distally to dull wood brown to tiller buff basally; sides of head and of throat, middle of throat, and chin dull buffy or brownish white, finely spotted with olive brown, fuscous, hair brown, and drab; remainder of under parts olive brown to fuscous, centers of feathers often paler; some feathers on middle part of lower part of breast tipped with dull buffy or brownish white; general appearance of lower surface, however, dark brown (excepting chin and throat); lining of wing light fuscous, some feathers tipped with dull buff or brownish white. Bill not swollen at base, brownish black, sometimes with traces of yellow on basal portion; iris dark brown; legs and feet brownish black or olive brown, webs dull black. *Adult female, winter*: Acquired by complete postnuptial molt. Not materially different from nuptial adult female. *Male, second nuptial*: Acquired by partial prenuptial molt from second winter. Similar to nuptial adult male, but upper surface more brownish; lower parts also more brownish, often lighter. *Male, second winter*: Acquired by complete molt from first nuptial. Similar to second nuptial male. *Male, first nuptial*: Acquired by wear and by partial molt from first winter. Resembling second winter male, but first (outermost) primary not emarginate; exposed surface of wings fuscous to light fuscous to hair brown; primaries and secondaries often partly tipped with dull buff or brownish white; jugulum, breast, sides, and flanks fuscous to fuscous black; remainder of lower parts brownish white, narrowly barred or spotted with fuscous to drab; under wing-coverts drab to light fuscous, tipped with dull white. Basal hump on culmen not conspicuous, being not yet well developed. *Male, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial male. *Female, second nuptial*: Acquired by partial molt from second winter. Resembling nuptial adult female, but upper parts lighter; lower surface paler, less uniform, with more light feather edgings. *Female, second winter*: Acquired by complete postnuptial molt from first nuptial. Like second nuptial female. *Female, first nuptial*: Acquired by wear and partial molt from first winter. Similar to second nuptial female, but first outermost primary not emarginate; plumage paler below (all but jugulum, sides, and sometimes lower abdomen, which are fuscous to hair brown), much lighter—dull brownish or buffy white—and spotted or brokenly barred with fuscous, drab, and light drab. *Female, first winter*: Acquired by partial postnuptial molt. Similar to first nuptial female. *Male, juvenal*: Acquired by complete postnatal molt. Upper parts, wings, and tail fuscous to light fuscous, except lesser wing-coverts, which verge to rufescent hair brown, and inner webs of basal two-thirds of primaries and tips of secondaries, which range from light brownish drab to buffy brown; sides of neck and of head below eyes brownish white with obscure short streaks and spots of drab; jugulum, upper breast, sides, and flanks buffy brown; chin, throat, lower breast, and abdomen brownish white, breast and abdomen laterally heavily—throat, middle of breast, and middle of abdomen lightly—barred or spotted with buffy brown to drab; lining of wing brownish drab, feathers tipped with brownish white. Bill and feet dull black; iris dark brown. *Female, juvenal*: Acquired by complete postnatal molt. Resembling first nuptial female but lighter above and below; less spotted on lower surface. Not certainly distinguishable from juvenal male.

MEASUREMENTS: *Adult male*: Wing, 214.1–233.9 (average, 224.6) mm.; tail, 83.1–102.1 (90.7); bill (exposed culmen), 39.1–47.0 (43.7); height of bill at base, 20.1–23.9 (23.1); tarsus, 43.9–49.5 (46.8); middle toe without claw, 63.0–72.9 (67.1). *Adult female*: Wing, 210.1–224.1 (216.2); tail, 66.0–72.9; bill, 39.1–41.9 (40.9); height of bill, 19.0–22.1 (20.3); tarsus, 42.9–49.0 (45.5); middle toe, 59.9–67.1 (64.0).

TEXAS: *Winter*: Six records (specimens?): Chambers Co., Cove (2 reported killed, Nov. 11, 1950, and Nov. 9, 1951, fide A. K. McKay); Galveston Co., Bolivar Peninsula (1 crippled male

found, died next day, Apr. 21, 1968, Ruth Isleib); Refugio Co., Copano Bay (1 shot by hunter, Dec. 10, 1941, identified by Connie Hagar); Cameron Co., Laguna Madre (Nov. 11, 1956, fide H. M. Reeves); Medina Co., Chacon Lake (1 taken by hunter, winter 1947–48, fide A. J. Kirn).

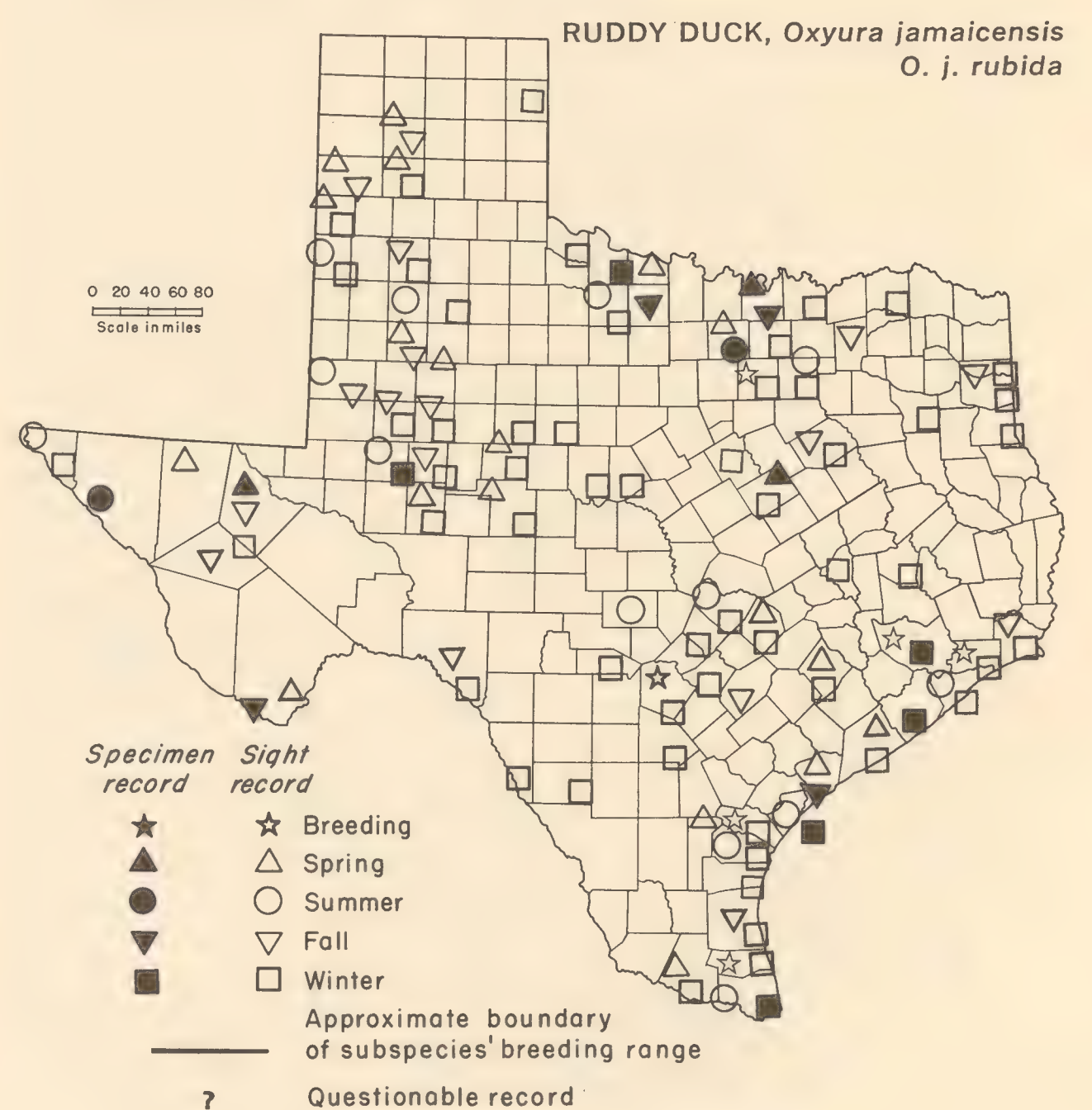
RUDDY DUCK, *Oxyura jamaicensis* (Gmelin)

SPECIES ACCOUNT

A small duck with a long stiff blackish tail (often cocked and spread like a fan); dorsal wing entirely dark brown. *Male*: glossy black crown and nape; large white patch on side of head; chestnut above, on chest, sides; grayish below, but with white crissum; blue bill. In winter, black and chestnut replaced by grayish brown; bill dark gray. *Female*: dark brown crown; buffy side of face broken by one thin dark brown facial stripe from gape to ear region; brownish black above; brown-mottled buffy chest, sides; below as in male; dark grayish bill. Length, 15 in.; wingspan, 22¾; weight, 1¼ lbs.

RANGE: British Columbia to Mackenzie (Great Slave Lake) and Nova Scotia, south through United States and Mexico to Guatemala; West Indies; and c. and e. Andes of Colombia. In winter, northern race withdraws from Canada, except s. British Columbia.

TEXAS: (See map.) *Breeding*: May to Aug. (eggs, June 1 to July 21; ducklings, June 5 to Aug. 19) from near sea level to about 700 ft. Rare, irregular, and highly local inland with records from Tarrant Co. (pair with 8 ducklings, July 5, 1970, Mary Lowe, Edith Bowman) and Bexar Co. (last record, nest and eggs, 1933, A. J. Kirn). Records somewhat more frequent along coast: Chambers Co., Anahuac Nat. Wildlife Refuge



(1 brood seen, Aug.–Sept., 1968, R. W. Clapper); Harris Co., Jacinto City (eggs and young, summer 1959, T. B. Feltner); San Patricio Co., Welder Wildlife Refuge (latest, several pairs nesting, summer 1969, Clarence Cottam); and Willacy Co. (San Perlita, 1 female with 5 ducklings, Aug. 19, 1966, J. C. Arvin; Willamar, 1 female with 8 young, mid-Aug., 1968, Mr. and Mrs. J. H. Pierce). Other summer records throughout state more likely represent lingerers than breeders. *Winter*: Oct. to May (extremes: Aug. 20, June 16). Locally very common to fairly common along coast; irregularly common to rare elsewhere in state; in northern half most numerous in spring and fall.

HAUNTS AND HABITS: The Ruddy Duck and the rare, mysterious Masked Duck are the only North American members of the quaint little stiff-tails (*Oxyurinae*). Among common American waterfowl *Oxyura jamaicensis* has numerous distinctions: The male is the only drake with an inflatable air sac (in the neck), used in his flamboyant nuptial display; also he has separate summer and winter plumages (a condition shared only with the Oldsquaw), rather than the briefly worn eclipse so typical of most ducks. Finally, he is one of the few drakes which aids in raising the young. The diminutive female Ruddy lays enormous eggs; a clutch of fourteen eggs weighs about three pounds, approximately three times more than she does! She and her mate sometimes raise two broods per season, an atypical trait of Anatidae. Lastly, the extremely precocious young dive for food immediately after getting in the water, a task performed by ducklings of other species only after several weeks of surface feeding.

In habitat as well as behavior, the stiff-tails are perhaps the most grebelike of ducks. In Texas, as elsewhere, the Ruddy nests in freshwater ponds and lakes, usually those with plenty of cattails (*Typha*) or similar aquatic vegetation. In winter, it still prefers fresh water, but some occur in brackish marshes or even salt bays. It migrates in medium to large flocks which fly by night; at other seasons, it is seen singly, in pairs, or small groups.

To aid takeoff, the Ruddy patters vigorously along the water's surface on large strong feet; underway, it is swift but erratic. Because its rapidly beating, short wings make a buzzy noise in flight, *O. jamaicensis* suggests a giant bumblebee as it dashes close over water or ground. Even nocturnal migrants fly low. In the water, the Ruddy is one of the most animated and agile of ducks. The legs—placed well back on the body—are excellent for swimming but are virtually functionless on land, where the bird, after a few clumsy steps, collapses and must push itself along on the ground. It can dive or sink instantly with no sound or disturbance of the water. In fact, the bird prefers this means of escape to flying. Seventy-five percent of this duck's diet is plant material: seeds, leaves, and stems of wildcelery (*Vallisneria americana*), bulrushes (*Scirpus*), other sedges, and various pondweeds; on wintering grounds, widgeongrass (*Ruppia maritima*) is a favored item. The Ruddy also eats soft-bodied aquatic insects (chief-

ly midge, horsefly, and caddis fly larvae, and water boatmen), a few crustaceans, and shellfish.

During the drake's hectic courtship activity—one of the most spectacular displays among ducks—he sounds several vocalizations. He circles the female, cocks his tail over his back until it almost touches his head, inflates the air sac, pumps his head up and down, and spurts water out to each side by kicking his feet; at intervals he utters one of the following: *chuck-chuck-chuck-chuck-chur-r-r*; *ip-ip-ip-ip-u-cluck*; *tick, tick, tick, tickey, quo-ack*; or *chica, chica, chica, chica, quak*. Both male and female Ruddy Ducks are otherwise silent.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTH AMERICAN RUDDY DUCK, *Oxyura jamaicensis rubida* (Wilson)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Pileum down to and including eyes and upper hindneck glossy black; scapulars, upper tail-coverts, hindneck, and back chestnut; rump and rest of wings fuscous; lesser wing-coverts, speculum, and inner webs of primaries rufescent hair brown; tail fuscous; anterior part of chin white, as is a large oblong patch on side of head extending from bill back to side of occiput; throat and sides chestnut; remainder of lower parts, including lining of wing, hair brown conspicuously edged with dull white or buffy white; breast edged with cinnamon buff; longest lower tail-coverts white. Bill light grayish blue or turquoise blue, paler at base, duller on culmen, or maxilla azure blue, but mandible mostly white; iris prout brown or hazel; legs and feet dull bluish gray or mouse gray, but outer side slate black, webs of toes black; claws clove brown or black. *Adult male, winter:* Acquired by complete postnuptial molt. Pileum fuscous black; nape between buffy brown and hair brown, narrowly barred with fuscous or fuscous black; back and remainder of upper parts fuscous, finely barred and vermiculated with pale dull buff and white; tail chaetura drab; wings nearly uniform fuscous, rather lighter on inner webs of quills; chin and large patch on side of head from bill to occiput pure white, as in nuptial adult male; throat and sides of neck hair brown, paler anteriorly; jugulum chaetura drab; rest of lower parts hair brown, anteriorly broadly edged with light buff, elsewhere with buffy white. Maxilla black; mandible raw umber; legs and feet olive, but webs of toes black; claws clove brown. *Adult female, nuptial:* Acquired by partial prenuptial molt. Upper parts fuscous black, finely mottled, vermiculated, and irregularly and indistinctly barred with tawny, russet, ochraceous, and buff; tail chaetura black; wings fuscous, inner edges of wing-quills drab; upper wing-coverts dull hair brown; some secondaries very narrowly tipped with dull white; sides of head and of neck dull buff or buffy white, more or less mixed with fine specks of fuscous, narrow rictal stripe of dull buffy brown and fuscous; anterior part of chin white; posterior part of chin dull hair brown or light drab; throat fuscous edged with buffy brown; jugulum cinnamon and tawny cinnamon; sides of body dull olive brown, broadly edged and vermiculated with tawny and buff; remainder of lower parts pinkish buff, feathers underneath hair brown; lining of wing white, much spotted and mixed with dull hair brown; axillars largely white. Maxilla black or brownish black; mandible drab; iris seal brown; legs and feet externally slate black or dark brown, but on inner side slate gray, webs of toes black; claws slate black. *Adult female, winter:* Acquired by complete posinuptial molt. Like nuptial adult female but rather duller. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male but darker and with some dull brown feathers in chestnut parts of plumage. Bill clove brown; iris seal brown. *Male, first winter:* Acquired by partial postjuvenal molt. Similar to adult male in winter, but with wings of juvenal retained; otherwise somewhat duller. Bill and

feet black; legs brown; iris brownish black. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to adult female in winter, but with retention of wings of juvenal. Maxilla dark clove brown; mandible sepia, mottled with pale ecru drab; iris vandyke brown; legs and feet bluish olive gray, but outer side and joints slate black; claws black. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but upper parts duller, more definitely barred with buff or dull white on back, rump, scapulars, and upper tail-coverts; throat and cheeks dull white, mottled with drab, drab gray, or smoke gray; lower parts paler and more whitish; sides and flanks distinctly barred with fuscous or hair brown. Maxilla dark clove brown, nail ecru drab; mandible pale ecru drab mottled with pinkish drab, nail vinaceous; legs and feet dark clove brown; claws seal brown. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male but conspicuously smaller. Legs and feet olive gray, but webs of toes mouse gray. *Natal*: Upper parts clove brown to dark sepia; back lighter; spot on each scapular region dull buffy white; breast and sides fuscous to sandford brown; remainder of lower parts dull white or buffy white.

MEASUREMENTS: *Adult male*: Wing, 138.4–148.1 (average, 143.3) mm.; tail, 68.1–77.0 (72.2); bill (exposed culmen), 37.8–42.9 (40.6); height of bill at base, 17.5–21.1 (19.6); tarsus, 33.0–36.6 (34.8); middle toe without claw, 55.1–62.0 (57.4). *Adult female*: Wing, 132.1–147.1 (140.0); tail, 64.0–78.0 (69.3); bill, 38.1–42.9 (40.1); height of bill, 17.5–20.6 (19.0); tarsus, 32.5–35.1 (33.5); middle toe, 54.1–57.9 (56.4).

RANGE: C. British Columbia, n. Alberta, c. Saskatchewan, also probably s. Mackenzie (Great Slave Lake) and n. Manitoba, and possibly—at least formerly—n. Labrador, south very locally to California, n. New Mexico, Texas, Iowa, Ohio, and Pennsylvania, irregularly to s.w. Louisiana and n.e. Florida, thence to c. Baja California, Valley of México, and Guatemala. Winters chiefly from s. British Columbia, Colorado, Texas, Tennessee, and Maryland through Mexico to Costa Rica; also Bahamas.

TEXAS: *Breeding*: See species account. *Winter*: Taken north to Wilbarger, east to Harris, south to Aransas and Cameron, west to Brewster (Oct. 26), and Hudspeth (June 23) cos.

NESTING: *Nest*: In marshes, along marshy rivers, marshy lakes, or sloughs; usually a raft floating in water, sometimes in cavity of floating log, or on ground; made of rushes, grasses, reeds, flags, and other water plants; slightly lined with bits of reeds, flags, and down. *Eggs*: 5–20, usually 6–10; oval to elliptical oval or ovate to elongate ovate; grayish white, cream white, or buffy white; unmarked but often nest stained; average size, 62.2 × 45.7 mm.

MASKED DUCK, *Nomonyx dominicus* (Linnaeus)

SPECIES ACCOUNT

Oxyura dominica of A.O.U. check-list, 1957 (see Appendix A). A small duck with a long stiff blackish tail (frequently cocked and spread fan-wise); in flight, reveals (above) white patch on inner wing. *Male*: black face from base of bill to crown and ear region; chestnut on rest of upper parts, chest, and sides (back and sides liberally spotted with black); remaining under parts whitish buff; bluish bill with black nail. *Female*: dark brown crown; buffy white sides of face broken by two broad dark brown facial stripes (one through eye, other from gape to ear); mottled blackish brown back, chest, and sides; belly similar to male's; brown bill. Length, 13¾ in.; wingspan, 21½; weight, 12¾ oz.

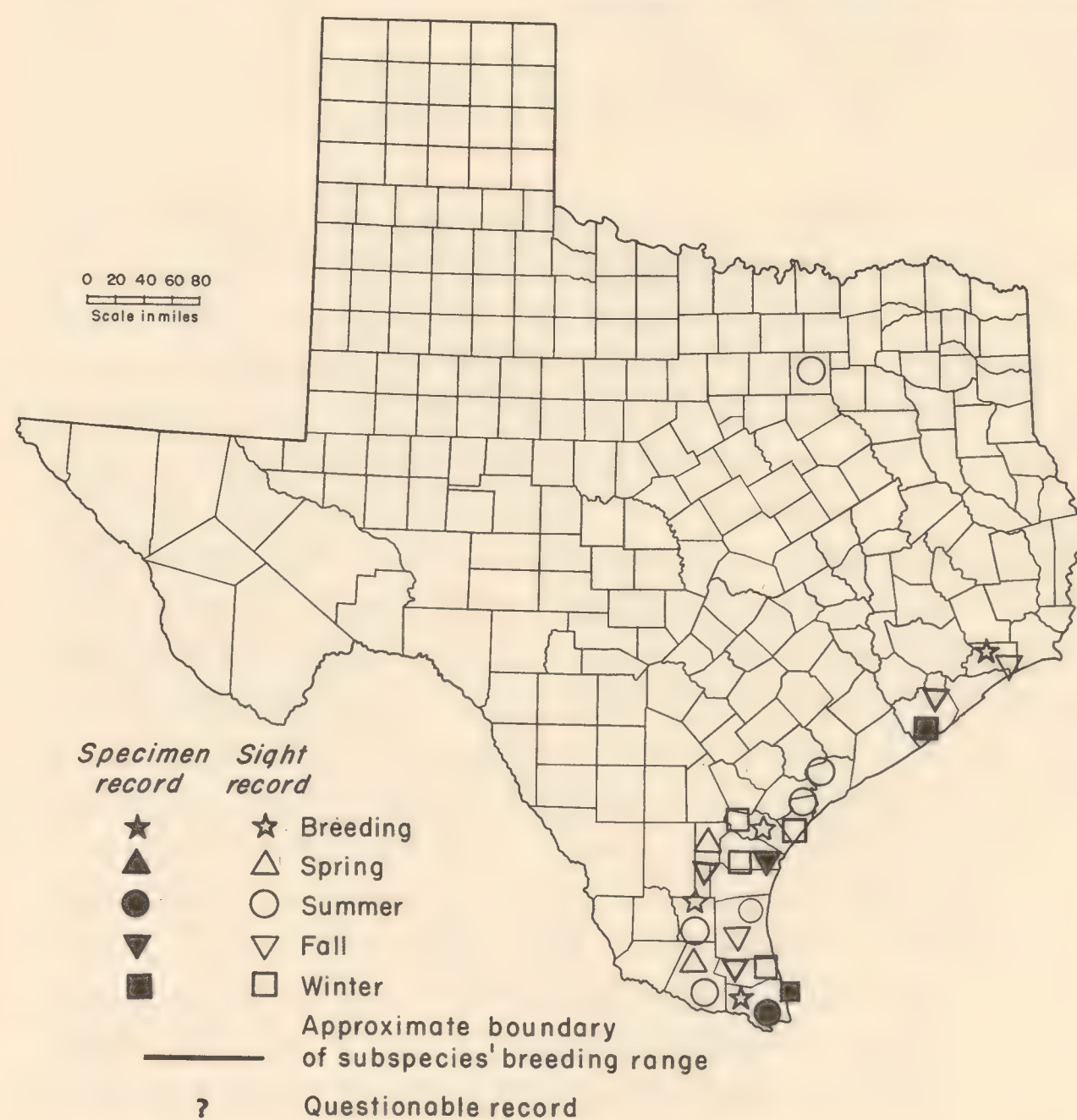
RANGE: Costa Rica and Panama (breeding status uncertain elsewhere in Central America), south to n. Chile and n. Argentina; also Antilles (rare east of His-

paniola) and Trinidad; very local and irregular in s. Texas and Mexico. Wanders extensively.

TEXAS: (See map.) *Resident* (sporadic): Breeds, Apr. to Nov. (eggs, only record in state, Sept. 15, 1968; young, May 2 to Nov. 16) from near sea level to 109 ft. Very rare, local, and irregular on and near coast from Cameron Co. to Chambers Co. Has bred: Cameron Co. (near Brownsville, adult and 5 young, May 2, 1930, Bessie Reid; near San Benito, female and 1 young, June 21, 1934, Reid; Resaca de los Fresnos near Harlingen, 3 adults and 5 young, July 6, 1937, H. C. Blanchard); Brooks Co., Falfurrias area (female incubating 6 eggs, first active nest found in U.S., Sept. 15, 1968—eggs hatched Oct. 2 or 3—Dr. A. W. O'Neil); San Patricio Co., Welder Wildlife Refuge (pair fledged young, Oct. 15, 1968, Clarence Cottam); and Chambers Co., Anahuac Nat. Wildlife Refuge (female with 4 young only few days old observed on Oct. 2, 1967, they were watched until Nov. 16, when a young from later brood seen with them, R. W. Clapper, Norma Oates, Linda Snyder, et al.; female with 8 young, Oct. 26, 1969, V. L. Emanuel, Noel Pettingell). May have bred in Nueces Co., Flour Bluff area (male and 3 immatures or females, Nov. 10, 1968—by early Dec. as many as 10 immatures or females—G. W. Blacklock, T. S. Schulenberg, et al.). Casual in Dallas Co., Dallas (1 seen, July 18, 1970, 2 seen, Aug. 22, 1970, Hazel Nichols, et al.). Winter records are few, but specimen taken in Brazoria Co. (see detailed account); recent sighting from San Patricio Co., Welder Wildlife Refuge (3 on Audubon Christmas Bird Count, Dec. 30, 1969, C. Cottam).

HAUNTS AND HABITS: The small shy Masked Duck—most numerous in eastern South America—is a tropical American counterpart of the Ruddy Duck. Its haunts are tangled mangrove swamps or freshwater marshes

MASKED DUCK, *Nomonyx dominicus*



growing thickly with grass, reeds, and other aquatic plants; in such places it effectively conceals its nest, as well as itself. This elusive duck is difficult to flush; instead of flying when frightened, it usually dives grebe-like. The species is largely resident, but individuals tend to wander widely, usually traveling by night. This accounts for stragglers in resacas of the Rio Grande delta and marshes along the Texas Gulf coast. As a breeder it is also unpredictable. In the 1930's, Texas nesting was apparently confined to the Rio Grande delta; in the 1960's, broods were seen almost exclusively at Welder Wildlife Refuge, central coast, and Anahuac National Wildlife Refuge, upper coast.

When resorting to flight, the Masked either rises straight from the water like a teal, or it patters along the surface for several yards before launching into the air. It takes wing more often and apparently with more ease than does the Ruddy; late evening and early morning are especially favored flying times. The Masked, like the Ruddy, is an expert swimmer and diver but can barely walk on land. Aquatic plants, seeds, and insects comprise its diet.

The Masked Duck is usually as silent as it is secretive. Individuals sometimes respond to a loud noise in their marsh with a clucking *kirri-kirroo* several times repeated; a short note, suggesting a car horn, is also sounded. Females are said to hiss.

CHANGES: The Masked Duck, like the Fulvous Tree Duck, seems to have moved northward along the Texas coast since the 1890's. As late as the 1930's, it still seemed limited to resacas lined with Texas palm (*Sabal texana*) and thornbrush in the vicinity of Brownsville. During the 1940's and 1950's, the species largely dropped out of sight in the state, but in the 1960's and early 1970's it reappeared in grassy—especially cordgrass (*Spartina*)—open marshes on the central and upper coast. Apparently, the Masked Duck is indifferent to trees but requires reasonably clean water with aquatic plants and animals living in it. Since 1950, resacas of the Rio Grande have been moribund and murky with heavy burdens of silt, pesticides, and herbicides from surrounding agricultural operations.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Forehead brown; sides of head and chin dull black; occiput, foreneck, hindneck, back, scapulars, and upper tail-coverts between chestnut and russet; upper parts, except upper part of back, with broad fuscous black, mostly pointed, centers on feathers; tail fuscous to fuscous black; rump and lower back narrowly barred with buffy white or pale buff; wing-quills fuscous, greater part of wing-coverts between fuscous and hair brown; large spot on wing white, formed by outer, median, and greater wing-coverts and bases of outermost secondaries; sides and breast tawny or russet with conspicuous spots and streaks of fuscous or fuscous black; remainder of lower parts light buff or ochraceous tawny, crissum rather darker, and all feathers underneath hair brown—showing through plumage and presenting more or less mottled appearance on lower parts; lining of wing hair brown. Maxilla pale blue; culmen, nail, and bare skin of chin black; mandible whitish with black or flesh color tip; eyelids pale blue; iris dark or reddish brown; outer sides of tarsus and two outer toes black or dark brown, tarsus on inner side and inner toe and webs of toes light

brown marked with black. *Adult female, nuptial:* Forehead and crown dark brown; sides of head and chin buffy white with two broad dark brown facial stripes (one through eye, other from gape to ear); occiput much mixed with dull ochraceous buff and tawny; remainder of upper parts fuscous black conspicuously but irregularly barred with dull ochraceous buff, tawny, and light buff; tail fuscous black; wings between olive brown and fuscous, almost uniform but with a few spots of cinnamon buff and russet, and with broad white patch formed by bases of secondaries and outermost greater coverts; lining of wing between hair brown and drab, faintly spotted or edged with grayish white; upper throat light cinnamon buff to cinnamon, posteriorly feathers with fuscous black centers; lower throat clay color, somewhat mixed with tawny, centers of feathers fuscous black; breast dull cinnamon buff; remainder of lower parts light buff, feathers below surface hair brown, showing through here and there in form of spots; sides, flanks, and crissum fuscous or fuscous black, broadly edged with light buff and cinnamon buff. Bill brown, tipped black, pink underneath; iris brown; legs as in male. *Immature male:* Similar to adult female but darker with lower parts more pinkish cinnamon. *Juvenal:* Acquired by complete post-natal molt. Similar to adult female but lighter and less blackish; upper parts, sides, and flanks more heavily barred with cinnamon. *Natal:* Crown between fuscous and sepia; hindneck buffy brown; remainder of upper parts between clove brown and buffy brown, yellowish or buffy spot on each side of back and on each side of rump; sides of head dull pale buff with dark brown ocular stripe and broad rictal stripe; lower parts buffy or brownish white, posteriorly pale dull drab. Bill reddish brown; iris dark brown; feet greenish gray; webs and toes edged with yellowish white.

MEASUREMENTS: *Adult male:* Wing, 136.9–146.0 (average, 139.7) mm.; tail, 74.4–86.1 (79.5); bill (exposed culmen), 32.0–35.6 (33.3); height of bill at base, 15.5–17.3 (16.8); tarsus, 26.7–28.2 (27.4); middle toe without claw, 46.0–48.0 (47.0). *Adult female:* Wing, 135.1–141.0 (136.9); tail, 71.9–88.9 (79.5); bill, 31.0–33.5 (32.3); height of bill, 15.0–17.5 (16.3); tarsus, 23.9–28.4 (27.4); middle toe, 43.9–49.5 (46.5).

TEXAS: *Resident* (sporadic): Five specimens: Cameron Co., about 5 mi. north of Brownsville (female, July 22, 1891, W. Lloyd; U.S. Nat. Museum collection, no. 141451); Cameron Co., near Brownsville (male, July 18, 1891, F. B. Armstrong); Cameron Co., Laguna Atascosa Nat. Wildlife Refuge (immature male, Jan. 31, 1968, H. Folzenlogen; U.S. Nat. Museum collection, no. 531714); Nueces Co., Encinal Peninsula (immature male found dead, Nov. 24, 1968, T. S. Schulenberg; Welder Wildlife Refuge collection, no. 1532); Brazoria Co., Eagle Nest Lake (male, Jan. 2, 1927, shot by B. W. Cammer; U.S. Nat. Museum collection, no. 300115). No specimen from Chambers Co., but 2 young photographed at Anahuac Nat. Wildlife Refuge (Nov. 4, 1967, by D. M. Hagemeyer; published on cover of *Audubon Field Notes*, vol. 22 [1968], no. 1).

NESTING: *Nest:* In small lagoons, usually among grass or rushes; flat platform of green rushes, with little or no lining. *Eggs:* 2–6; oval, rounded ovate, or almost round; cream colored, white, or pale bluish white; unmarked; average size, 59.9 × 43.9 mm. A small egg from Cuba measured 53.7 × 40.0 (James Bond).

HOODED MERGANSER, *Lophodytes cucullatus* (Linnaeus)

SPECIES ACCOUNT

A small merganser with a short serrated blackish bill. *Male:* prominent black-edged white crest (fan-shaped when spread); glossy black head, neck, and back; rufous sides; two black strokes extending diagonally from shoulder onto side of white chest; white on remaining under parts. In flight, shows (above) mostly grayish

patch on inner wing with small white patch on trailing edge; (below) blackish border on leading edge of wing-lining. *Female*: rounded cinnamon crest; brown head, neck, back; pale grayish chest, sides; otherwise white below. Dorsal wing uniformly dark brownish with small white patch on trailing edge of inner wing; underwing similar to male's. Length, $17\frac{3}{4}$ in.; wing-span, $25\frac{1}{2}$; weight, $1\frac{1}{4}$ lbs.

RANGE: Locally from British Columbia, c. Ontario, and New Brunswick, south to n.w. Oregon, c. Wyoming, c. Iowa, Wisconsin, and Pennsylvania; sporadically in s.e. states. Winters mainly from British Columbia to s. California (rarely Baja California), on Lake Michigan, and from Massachusetts to n. Florida, Texas, and Tamaulipas; also West Indies (rarely).

TEXAS: (See map.) *Winter*: Nov. to Mar. (extremes: Aug. 19, May 29—once in early June). Irregularly fairly common to rare and local throughout; most likely to occur in numbers in northern third.

HAUNTS AND HABITS: Along placid wooded riverbottoms, lakes, and pools of interior North America, the elegant Hooded Merganser finds prime breeding haunts. Practically any sort of tree cavity is suitable for its clutch of ten to twelve white eggs; birds show no preference for the hole's shape, its height from the ground, or for the species of tree. No material is brought to the nest—moss, chips, or other debris already there suffice. Where their ranges overlap, the Hooded Merganser and Wood Duck compete somewhat for nest sites; as a rule, the former yields to *Aix sponsa*. In winter, birds remain on inland waters or move to coastal areas where they quarter, for the most part, in freshwater marshes, sometimes in brackish lagoons and inlets. Nowhere as numerous as the Com-

mon and Red-breasted mergansers, the Hooded is seen singly, in pairs, or in small parties of five or six.

On the wing, the Hooded is exceedingly swift. Flight, typical of the mergansers, is direct with rapid wing-beats; the bird appears very sleek as it moves with bill, head, and neck in arrow-straight alignment with the body. Lighter than its two bulkier relatives, the Hooded experiences little difficulty in rising from water. As it feeds, it seizes food on or just below the water's surface but also dives to the bottom to forage. This merganser eats many insects, also small fish, frogs, tadpoles, snails, and a few pondweeds. It is an excellent swimmer and graceful diver and moves underwater rapidly. When frightened, the Hooded sinks in a flash like a grebe. The bill, though shorter than the sabrelike beaks of the Common and Red-breasted, is equipped with similar serrations for gripping aquatic food. The Hooded's "saw teeth," however, are more or less perpendicular on the upper mandible, rather than slanting toward the bill base as in the other mergansers.

The Hooded Merganser sounds a rough, grunting, croaking series, rendered as *croo, croo, crooh*; this vocalization is ascribed both to the female, as she alerts her ducklings of danger, and to the drake, in nuptial display or as he flies about his mate's nest hole.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial postaestival molt. Forehead, back, and rump clove brown; upper tail-coverts fuscous with lighter and more rufescent tips; remainder of upper parts, including tips of long crest feathers, glossy black with metallic olive green gloss on sides of head and neck and somewhat purplish gloss on lower neck; large triangular white spot on side of head, which starts behind eye and covers most of basal portion of fanlike crest feathers; primaries fuscous, rather darker terminally, inner webs drab; bend of wing chaetura drab edged with neutral gray; outer median coverts and some of middle lesser coverts forming drab gray spot, this bordered behind successively by a dull black bar, a white bar on greater coverts, and a broader black bar on secondaries, these succeeded by white speculum formed by outer webs of secondaries; tertials and secondaries glossy black with metallic greenish luster, elongated tertials with long white shaft stripes; chin and lores clove brown; remainder of sides of head and of neck, with throat, black with metallic dark green sheen which becomes more purplish posteriorly; lower throat and jugulum with large triangular white area which reaches almost completely around neck posteriorly; succeeding this is subtriangular black bar on each side which, narrowing in front, almost meets across center of throat, its place there taken by several detached irregular dull black bars; this single black bar succeeded posteriorly by white bar on each side of upper breast, the feathers of this bar broadly tipped laterally with black; sides and flanks wood brown to bright russet, finely barred or vermiculated with fuscous; remainder of lower parts white, vermiculated laterally, also on crissum, with hair brown, this color merging into wood brown on remainder of sides and flanks; lining of wing white medially, otherwise hair brown or chaetura drab, the feathers tipped with white. Bill black; iris bright yellow; legs and feet yellowish brown or dull yellowish olive, but hind edge of tarsus, with webs of toes, black; claws dark brown. *Adult male, eclipse:* Acquired by complete postnuptial molt. Black of head and neck mottled with brown; breast and flanks similar to those of adult female. *Adult female, winter and nuptial:* Acquired by partial postaestival molt. Pileum rufescent hair brown; rather long crest

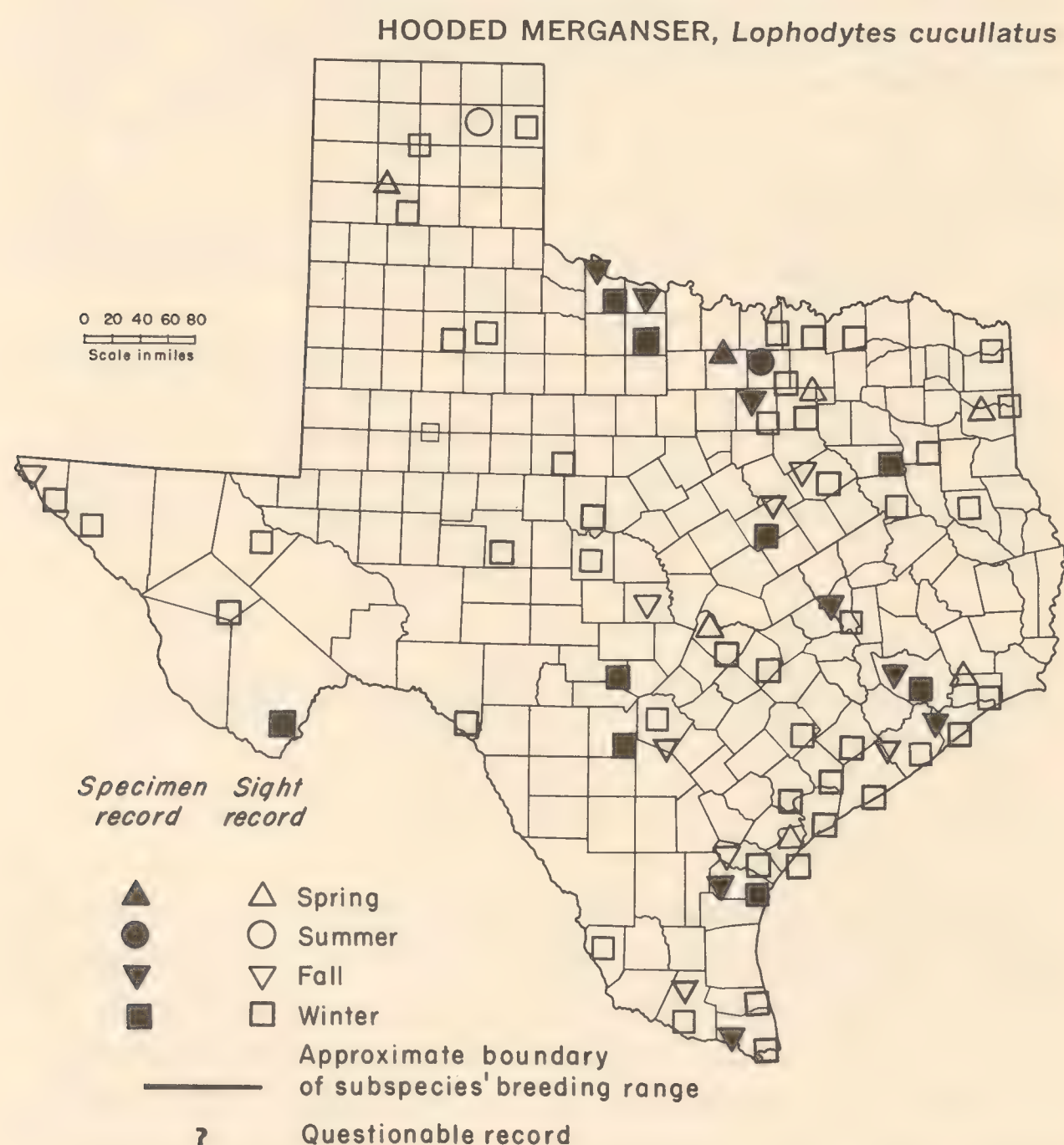




PLATE 5: Red-tailed Hawk, *Buteo jamaicensis*
immature (lower left), adult (upper right)

russet cinnamon with buffy white tip; nape dark hair brown; back fuscous; rump fuscous black; upper tail-coverts between clove brown and sepia; tail and wing-quills fuscous, inner webs drab; lesser wing-coverts chaetura drab, much edged with dull hair brown; outer webs of tertials dull black, these feathers with broad white shaft streaks; narrow white bar on wing formed by tips of greater wing-coverts, this separated by a black bar from a small white speculum formed by outer edges of terminal portions of inner secondaries; lining of wing white, exteriorly mottled with dark hair brown; sides of head and of neck, foreneck, sides of body, and crissum rufescent hair brown, feathers of sides and crissum broadly tipped with white; chin and upper throat mostly dull buffy white mottled with rufescent hair brown; jugulum hair brown, feathers broadly margined with dull white; flanks light olive brown; breast, abdomen, and central part of crissum white. Bill dull black or dull dark green, but edges of maxilla and nearly all mandible orange or yellow; iris hazel; legs and feet dark brown or olivaceous, but webs of toes black. *Adult female, eclipse*: Acquired by complete postnuptial molt. Similar to winter-nuptial adult female. *Male, second nuptial*: Acquired by partial prenuptial molt. Very similar to winter-nuptial adult male but somewhat duller. *Male, second winter*: Acquired by complete postnuptial molt. Similar to first nuptial, but wings more like adult male, though still without light gray lesser wing-coverts and greater wing-coverts, these only slightly tipped with white. *Male, first nuptial*: Acquired by partial prenuptial molt. Practically identical with first winter male. *Male, first winter*: Acquired by wear from juvenal, with which it agrees, except for slightly lighter coloration due to fading. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, but crest very much shorter; colors duller and more brownish. *Female, first winter*: Acquired by wear from juvenal, with which it is essentially identical. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female, but above more brownish or buffy, less grayish; throat and sides of head paler, more buffy or whitish; crest lacking. Maxilla gray; mandible dull flesh color; iris gray; feet gray.

MEASUREMENTS: *Adult male*: Wing, 188.0–201.9 (average, 195.3) mm.; tail, 86.1–91.9 (90.2); bill (exposed culmen), 37.1–41.9 (39.6); height of bill at base, 11.9–13.0 (12.4); tarsus, 31.0–34.0 (32.8); middle toe without claw, 47.0–51.6 (49.0). *Adult female*: Wing, 174.0–183.9 (180.3); tail, 84.1–90.9 (86.9); bill, 35.1–38.6 (36.8); height of bill, 10.9–12.4 (11.9); tarsus, 28.9–33.0 (31.5); middle toe, 42.9–49.0 (46.3).

TEXAS: *Winter*: Taken north to Wilbarger, east to Henderson and Galveston (Nov. 23), south to Nueces and Cameron (Nov. 18), west to Medina, Kerr, and Brewster cos.

COMMON MERGANSER, *Mergus merganser* Linnaeus

SPECIES ACCOUNT

Goosander of Old World authors. A large trim duck with a long, thin, serrated reddish bill (nostril near center). *Male*: not significantly crested; green-glossed black head; black mid-back; gray rump, tail; long longitudinal white wing-patch; salmon-tinged white upper back and under parts. In flight, reveals (above) large white patch on inner half of wing. *Female*: grayish back; white throat-patch; reddish head (slightly crested) and neck, sharply contrasting with whitish under parts. In flight, shows (above) small white patch on trailing edge of inner wing. Length, 25 in.; wing-span, 35½; weight, 3½ lbs.

RANGE: North America to Iceland, Scotland, Scandinavia, Baltic Sea region, Russia, c. Siberia, Mongolia, Sakhalin, and Kamchatka, and from Afghanistan and

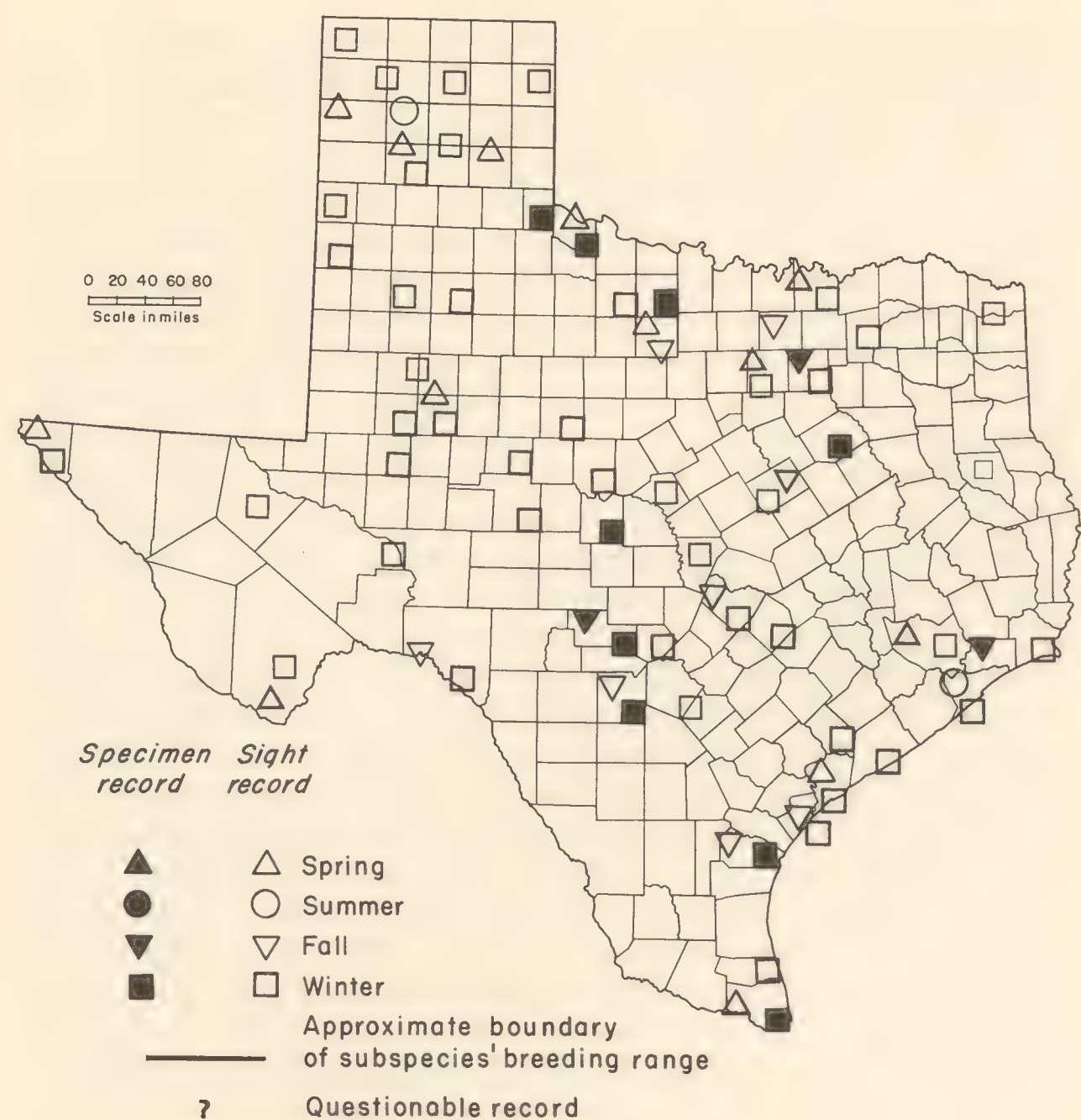
Himalayas to Tibet and Altai. Winters south of frozen water, chiefly to United States, Morocco, n. Mediterranean region, Black, Caspian, and Aral seas, c. India, n. Indochina, s.e. China, and Japan.

TEXAS: (See map.) *Winter*: Late Oct. to May (extremes: Oct. 21, June 16). Irregularly very common locally in northern and middle Panhandle; locally common to scarce in southern Panhandle and Trans-Pecos; scarce to rare throughout rest of state. One summer lingerer reported: Potter Co., Amarillo (1 male, summer 1961, Peggy Acord).

HAUNTS AND HABITS: The holarctic Common Merganser is the largest of the three North American mergansers ("saw-bills"). *Mergus merganser* seeks lakes and rivers of northern forests for breeding grounds; it retains this preference for fresh water even in winter when flocks move to large, more open bodies of water. Only a few Commons appear on brackish inlets and bays—usually the extent of the species' exposure to salt water. Following first spring thaws, birds return north early to nest. Eggs are laid, if possible, on a bed of soft down in a tree cavity; in lieu of this, a pair selects for its nest site a crevice between large boulders or under cover of dense bushes and nettles on the ground.

This heavy-bodied bird must struggle when taking off but in the air is swift, direct, and strong. Migrants, usually in rather small flocks, move high in the air at great speed; about the breeding and wintering areas, however, flight is low. In water, the Common Merganser performs all manner of dives. It sinks silently like a grebe (generally when frightened); or leaps a foot or so in the air, then arches gracefully headfirst into the water. From flight, it plunges with amazing swiftness and swims below the surface, where the bird's big webbed feet propel it rapidly. A foraging in-

COMMON MERGANSER, *Mergus merganser*



dividual skims the water with its bill tilted at an angle and its head submerged to about eye level. At this time it apparently strains water Shoveler-like for bits of food, but from this position it also dives to seize any fish it might see. Its prey—usually the slower rough species, such as gizzard and threadfin shad—are two to six inches in length, occasionally larger. Swift game fish, such as trout, are taken at a season when the merganser must work in fast-moving, unfrozen streams. A few mollusks, crustaceans, water insects, larvae, and some aquatic plants supplement the species' otherwise fish diet. This expert swimmer and diver is a lumbering pedestrian, and seldom, especially in winter, is it seen more than one or two yards from shoreline. Its gait is clumsy and tottering.

During the drake's elaborate bowing, splashing, and racing nuptial display, performed generally with several other males, he sounds a croaking *ereck*, which becomes metallic and bell-like as it is repeated.

CHANGES: According to G. F. Simmons in *Birds of the Austin Region*, the American Common Merganser was actually common in the winter of 1901–02. Since this date, however, the sight of even one *Mergus merganser* as far south as central Texas has been a freakish event. Perhaps warming of the North American climate, which took place in the first half of this century, encouraged this species to winter farther north. The bird is still numerous some years in the Panhandle, the only part of the state with significant snowfall. The orgy of dam building that occurred here, as elsewhere in the nation, during the 1950's and 1960's may have helped the Goosander in recent years.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN COMMON MERGANSER, *Mergus merganser americanus* Cassin

DESCRIPTION: *Adult male, winter and nuptial plumage*: Acquired by partial postaestival molt. Head and neck all around metallic dark green, more brownish on chin and forehead; lower neck white; back and scapulars black; middle of back and rump neutral gray changing to light neutral gray posteriorly, feathers anteriorly mostly with darker and more brownish centers; upper tail-coverts rather brownish neutral gray with fuscous shaft streaks and darker brownish centers; tail dark hair brown; lesser and median wing-coverts and outer scapulars white; basal portion of greater coverts, with most secondaries, white, innermost secondaries narrowly margined with black; primaries chaetura black, inner webs chaetura drab; tertials black; edge of wing hair brown and chaetura drab; flanks neutral gray, vermiculated with white; remainder of lower parts white, in life suffused with salmon buff, lateral lower tail-coverts vermiculated with hair brown or neutral gray; lining of wing anteriorly white, exteriorly much mixed with hair brown. Bill bright or deep vermilion red or burnt carmine, but culmen and nail black; iris carmine or dark brown with yellow outer ring; legs and feet scarlet vermilion, dark red, or orange; claws dull white. *Adult male, eclipse*: Acquired by complete postnuptial molt. Similar to adult female but without long crest; lesser wing-coverts white; jugulum gray, mixed with white; flanks as in winter-nuptial adult male. *Adult female, nuptial*: Acquired by wear from adult female in winter. Top of head and occipital crest verona brown; lores like crown but with long white mark in front of eye; remainder of sides of head, with neck and throat all around, russet; chin, lower cheeks, and upper throat white, latter finely spotted with russet; re-

maining upper parts rather brownish neutral gray, feathers with paler edgings and dark shaft stripes, this color darkest on back where it becomes dark hair brown and shafts of feathers fuscous; tail dark hair brown; primaries fuscous black, inner webs fuscous; lesser wing-coverts like back; greater wing-coverts chaetura drab, broadly tipped with white; secondaries chaetura drab; median feathers broadly white on terminal outer webs, some of them also on terminal inner webs, these forming conspicuous white wing-patch; jugulum rather brownish neutral gray, feathers tipped with dull white; sides of breast, of body, and crissum rather brownish neutral gray, most feathers tipped with white; remainder of lower parts creamy white, in life suffused with salmon buff; lining of wing white, outer coverts hair brown broadly tipped with white. Bill red, but culmen brownish, and nail brown or dull white; iris yellow, brownish umber, or dull red with outer ring of dull yellow; legs and feet creamy yellow, red, or orange, but toes with brownish webs. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to the nuptial adult female. *Male, first eclipse*: Acquired by complete postnuptial molt. Similar to adult male in eclipse, but wing-coverts gray; flanks and sides of body less completely vermiculated with white and gray. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to first winter male, but with gray-tipped black feathers on back, and with some black and some white scapulars, and at least a few white feathers on flanks, latter vermiculated with gray on outer webs and tips. *Male, first winter*: Acquired by partial postjuvinal molt. Similar to juvenal male, but with some black feathers on back, and nearly complete collar of white on lower part of neck. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female, but crest thinner and shorter; lower parts more whitish; inner secondaries usually lighter due to fading. *Female, first winter*: Acquired by partial postjuvinal molt. Similar to first nuptial female. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but lores, cheeks, and middle of throat white; russet areas of head and neck duller. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male but smaller. Maxilla fuscous or black, cutting edges and mandible onion skin pink; gonys sometimes dark coral red, and nails of maxilla and mandible both white; iris yellow, cream color, or light drab internally, white externally; legs and feet ochraceous buff on inner side, blackish brown on outer side, but webs of toes ochraceous buff to grayish olive; claws light drab.

MEASUREMENTS: *Adult male*: Wing, 260.1–279.9 (average, 268.2) mm.; tail, 94.0–105.4 (99.8); bill (exposed culmen), 53.1–58.2 (55.6); height of bill at base, 15.5–18.0 (16.8); tarsus, 49.0–52.6 (50.5); middle toe without claw, 62.0–65.0 (63.2). *Adult female*: Wing, 236.0–261.1 (245.6); tail, 87.6–95.5 (89.2); bill, 47.0–56.1 (49.8); height of bill, 12.7–16.0 (14.2); tarsus, 43.9–51.6 (47.3); middle toe, 56.4–65.0 (59.2).

RANGE: S. Alaska, Great Slave Lake, Manitoba, and s. Labrador, south to c. California, c. Arizona, and n.w. Chihuahua, thence to s.w. South Dakota, c. Michigan, Maine, and Nova Scotia. Winters chiefly from s. British Columbia, Minnesota, and Newfoundland to s. California, n. Texas, North Carolina, and a few to n. Mexico, Gulf states, and Florida; also Bermuda.

TEXAS: *Winter*: Taken north to Childress, east to Navarro and Chambers (Nov. 18), south to Nueces and Cameron, west to Medina and Pecos (ca. 1862) cos.

RED-BREASTED MERGANSER, *Mergus serrator* Linnaeus

SPECIES ACCOUNT

A large streamlined duck with a shaggy, double-pointed crest; long, narrow, serrated reddish bill (nostril near base). *Male*: green-glossed black head; white neck-collar; rusty upper chest; blackish back; pale grayish sides; black shoulder-patch with array of white

spots; salmon-tinged white below. In flight, shows (above) large white patch on inner half of wing; (below) dark chest-band against light body. *Female*: resembles female Common Merganser, but has shaggier crest; pale brownish (not reddish) head and neck, blending (not sharply contrasting) with whitish under parts; lacks distinct white throat-patch. Length, 22¼ in.; wingspan, 32; weight, 2½ lbs.

RANGE: N. Alaska, n. Keewatin, s. Baffin Island, and from approximately lat. 75° N. in Greenland (on coasts) and Eurasia, south to Aleutians, n. British Columbia, Great Lakes region, Nova Scotia, Iceland, British Isles, Denmark, Baltic Sea area, c. Russia, and Kamchatka Peninsula. Winters chiefly coastally, mainly from s.e. Alaska, Nova Scotia, British Isles, Scandinavia, w. Europe, Kamchatka, and Japan to Baja California, Gulf of Mexico, Mediterranean region, and s.e. China.

TEXAS: (See map.) *Winter*: Nov. to May (extremes: Sept. 18, May 28). Irregularly very common to fairly common on upper coast; common to uncommon on central and lower coasts; locally uncommon to rare and irregular over rest of state. Casual summer lingerers recorded in Randall Co. (1 male, June 28, 1963, J. M. Shepphard); Travis Co. (Mansfield Dam, 1 female, all summer 1953; and Tom Miller Dam, 1 female, July 15, 21, 1953, F. S. Webster, Jr.); and Aransas Co., Rockport (June 20, 1939, and July 15, 1944, Connie Hagar).

HAUNTS AND HABITS: Mainly in boreal forest regions, the holarctic Red-breasted Merganser nests near, and sometimes on, seacoasts; on small offshore islands; or on the borders of freshwater ponds, pools, or rivers. Nest sites are usually within twenty-five yards of water. Well hidden under a piece of driftwood or dense

canopy of brush, a depression is hollowed for the eight to ten olive buff eggs. This preference for the ground differs from the Hooded and Common mergansers, both of which typically lay their clutches in tree cavities. The male helps the female care for the ducklings—a most unusual trait for a duck—and families remain together until young are reared. Especially during cool months, *Mergus serrator* is more inclined to salt water than are its two relatives. On the Texas coast it is the common wintering merganser; most individuals seen here are in female or eclipse plumage.

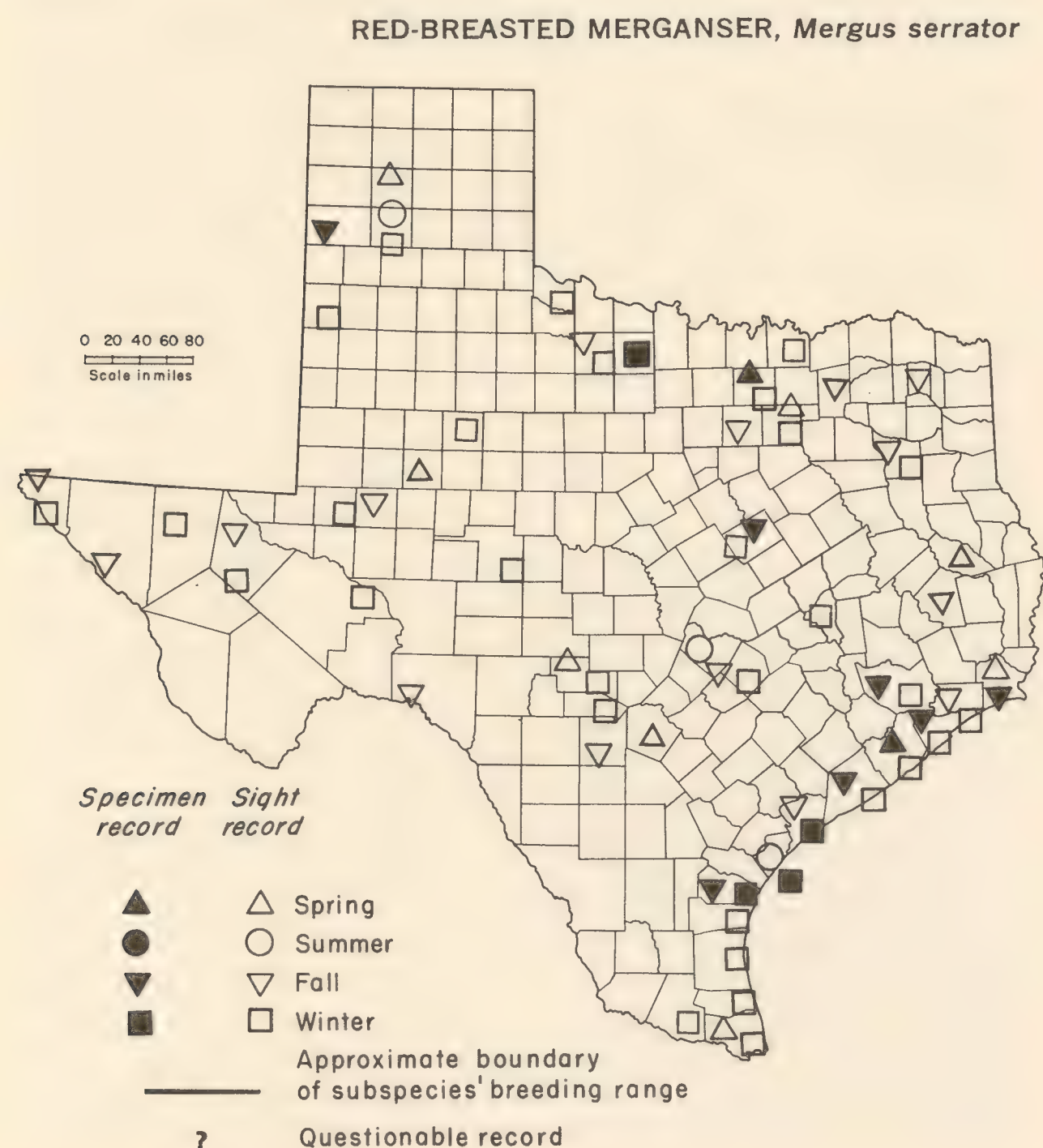
The Red-breasted exerts great effort to get airborne, particularly when there is no wind. Noisy flapping and strenuous pedaling with its feet on the ground or water help push it into the air. A trail of footprints twenty-nine yards long was left by one bird on an especially calm day. Birds, when not migrating, usually fly low. Red-breasted Mergansers often feed in a long line, swimming abreast into a shallow area and thus concentrating fish prey. At other times, individuals in the rear of a platoonlike group fly to the front of the feeding party, only to be replaced in leapfrog flight by the next rear group. The bill of this species, characteristic of mergansers, is edged with needle-sharp serrations ("teeth"); these slant inward so the bird can get a fast hold on slippery fish.

During the elaborate nuptial performance, the drake sounds a loud, rough, purring *da-ah* as he rocks, teeters, and bows in the water; the female sometimes replies with an even louder, raspy, single-noted *karrrr*. Otherwise, the Red-breasted Merganser is silent, except for an occasional hoarse croak.

DETAILED ACCOUNT: ONE SUBSPECIES

COMMON RED-BREASTED MERGANSER, *Mergus serrator* Linnaeus

DESCRIPTION: *Adult male, winter and nuptial plumage:* Acquired by partial post-aestival molt. Head, upper neck, chin, and throat fuscous black; remainder of sides of head metallic dark green; below this a broad pure white collar all around neck; lower neck fuscous to fuscous black, laterally heavily spotted with cinnamon; back dull glossy black with slight greenish sheen; rump and upper tail-coverts hair brown finely vermiculated with dull white; tail dark hair brown; primaries fuscous black, inner webs light fuscous; anterior lesser wing-coverts fuscous with paler edges; edge of wing of same color; posterior lesser wing-coverts and median coverts, with outer scapulars, white; greater coverts dull black at base, white terminally; secondaries dull black basally on outer webs, all but outer webs of outermost white, inner secondaries and longer tertials all white, edged with black, longest tertials fuscous black, longest scapulars glossy black; tufts of feathers on sides of breast dull black with large white centers; lining of wing white mottled chiefly on outer edge with hair brown; jugulum below white collar cinnamon, broadly streaked with fuscous; sides of body white, vermiculated and narrowly barred with chaetura black; breast white, in life tinged with salmon pink; remainder of lower parts white. Culmen slate black or seal brown; cutting edges liver brown or bay; mandible carmine, dragon blood red, or coral red, basally scarlet vermilion; inside of mouth orange or rufous; tongue and bare anterior part of chin rufous; iris orange vermilion or scarlet, but innermost ring brown; legs and feet madder brown or burnt carmine on outer side, dark reddish orange or scarlet, or vermilion on inner side; webs of toes clay color or reddish chestnut;



claws wood brown at base, mouse gray on middle portion, and dull white at tips. *Adult male, eclipse*: Acquired by complete postnuptial molt. Head, neck, and jugulum similar to adult female, but with less white on chin; upper parts mainly blackish brown, feathers tipped with gray; wings as in winter-nuptial adult male—that is, with median and posterior lesser coverts white; flanks and sides as in adult female. *Adult female, winter and nuptial*: Acquired by entire postaestival molt. Pileum between buffy brown and hair brown; upper neck dull cinnamon rufous; lower neck dull rufescent light hair brown, somewhat overlaid with white; remainder of upper surface hair brown, rather darker on mantle, feathers more or less broadly edged with light hair brown; tail dull hair brown; primaries fuscous black, light fuscous on inner webs; lesser wing-coverts similar to back; greater wing-coverts broadly tipped with white; outer secondaries white; inner secondaries white but partly hair brown; sides of head and of neck, with throat, dull cinnamon rufous, palest on throat and whitening on chin; short broad postocular streak and rictal stripe fuscous; lores centrally dull buff; jugulum hair brown edged with dull light buff and white; sides, flanks, and sides of crissum hair brown, feathers edged and tipped with very pale buff and dull white; remainder of lower parts white; lining of wing white, more or less mottled with hair brown. Bill deep carmine or madder brown, but culmen and nail dull brown or slate black; iris dark brown, maroon, or red; legs and feet rufous, dull red, or bright salmon on inner side, maroon on outside; webs of toes yellowish gray or walnut brown; claws drab to dull white. *Male, first eclipse*: Acquired by complete postnuptial molt. Similar to adult male in eclipse, but wing brown and slate color, without white before it is finally molted. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to winter-nuptial adult male, but back and wings like those of juvenal; only small amount of black among feathers of head and neck. Maxilla brownish black along culmen, becoming prout brown toward tip, including nail; mandible carnelian red, but nail buffy white; inside of mouth buff; iris isabella color; legs and feet on outer side morocco red,

on inner side salmon orange; webs of toes brussels brown; claws prout brown, tips dull white. *Male, first winter*: Acquired by wear from juvenal male, with which it is practically identical. Bill rufous, but culmen isabella color, nail of mandible cream buff; iris tawny; legs and feet rufous on outside, tawny on inside; webs of toes clay color. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, but crest shorter and thinner. *Female, first winter*: Acquired by wear from juvenal female, with which it is practically identical. Culmen drab; mandible coral red; legs and feet on outside vinaceous rufous, on inside orange rufous. *Male, juvenal*: Acquired by complete postnatal molt. Similar to adult female, but crest less developed. Bill shorter; tips of tail feathers squarish; colors generally duller; upper parts more grayish; whitish streak on lores either absent or very poorly indicated; cheeks and sides of neck paler; maxilla reddish brown, mandible orange-red; iris yellow; legs and feet brownish yellow; webs dull brown. *Female, juvenal*: Acquired by complete postnatal molt. Resembling juvenal male but smaller; innermost secondaries shorter, outer webs somewhat edged with dull black, and with little or no grayish bloom on secondaries. Maxilla clove brown, but nail grayish white; mandible and cutting edges of maxilla salmon color; nail of mandible pinkish white; legs and feet on outside cinnamon rufous, on inside pale orange rufous, but webs of toes isabella color; claws ecru drab to isabella color.

MEASUREMENTS: *Adult male*: Wing, 227.1–242.1 (average, 237.7) mm.; tail, 75.9–88.4 (82.8); bill (exposed culmen), 55.9–61.0 (58.4); height of bill at base, 13.2–16.0 (14.7); tarsus, 44.4–48.0 (46.3); middle toe without claw, 55.9–62.5 (59.2). *Adult female*: Wing, 206.0–218.9 (212.6); tail, 65.0–78.0 (69.3); bill, 48.0–55.1 (51.6); height of bill, 12.4–13.7 (13.0); tarsus, 41.7–44.2 (42.7); middle toe, 51.6–57.9 (55.1).

RANGE: Identical with that of species with exception of Greenland.

TEXAS: *Winter*: Taken northwest to Deaf Smith (Nov. 25), east to Denton (Apr. 16) and Jefferson (Nov. 10), south to Calhoun, Aransas, and Nueces cos.

American Vultures: Cathartidae

TURKEY VULTURE, *Cathartes aura* (Linnaeus)

SPECIES ACCOUNT

A very large, but small-headed bird with long wings and tail. Blackish brown above and below; reddish (blackish in immature) bare skin on head and neck covered sparsely with short black bristles. In flight, shows silvery flight feathers in contrast with blackish wing-linings; soars frequently, wings held dihedrally. Length, 26 in.; wingspan, 5¾ ft.; weight, ca. 4½ lbs.

RANGE: S. Canada, south through United States, Mexico, Central America, and South America to Tierra del Fuego (including coastal islets) and Falkland Islands; also Bahamas, Greater Antilles, and Trinidad. More or less resident in most portions of range, but in w. North America, highly migratory, some individuals moving to South America in winter.

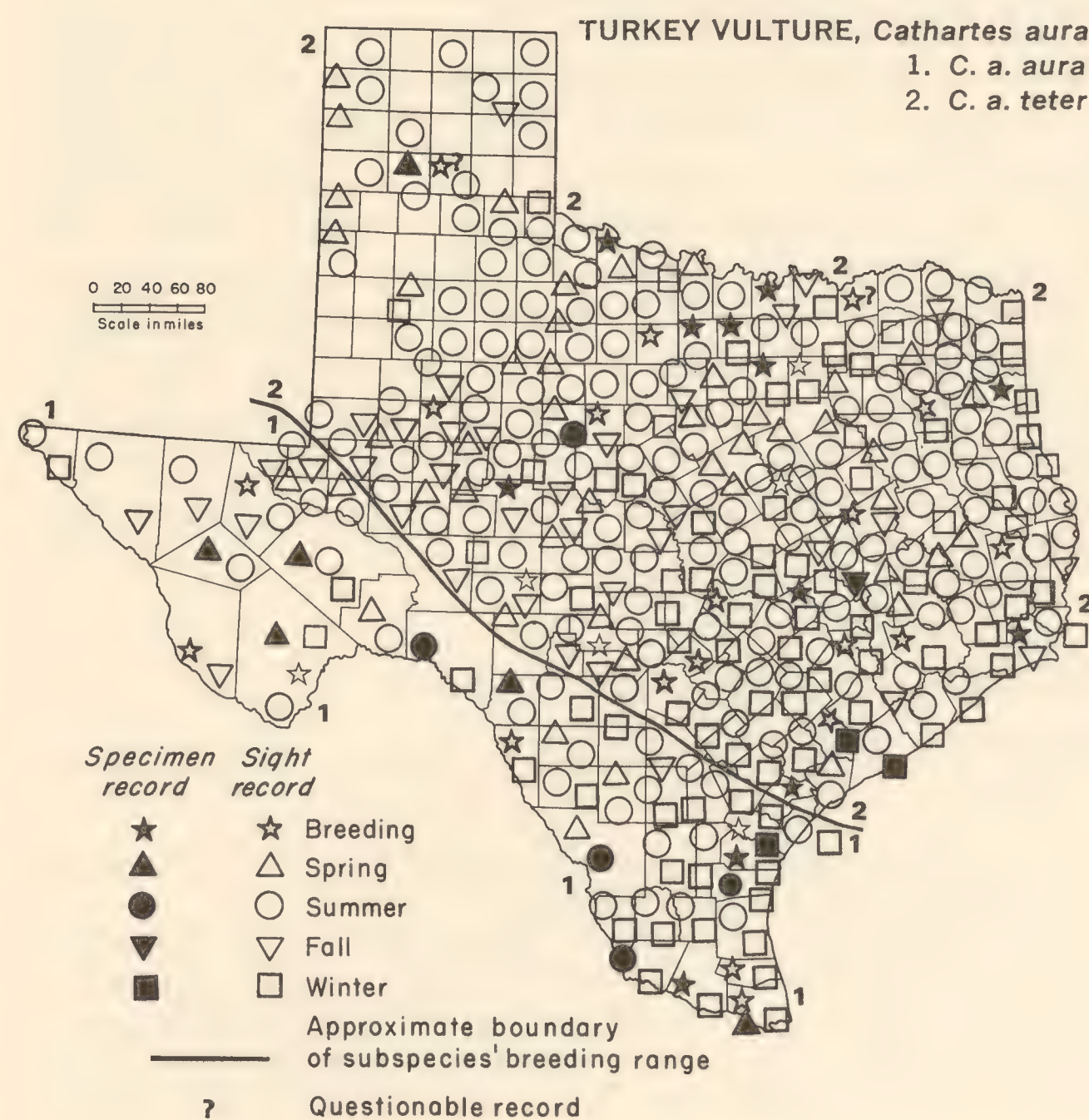
TEXAS: (See map.) *Resident* (year-round in east; summer in west): Breeds, Feb. into July (eggs, Feb. 15 to July 20) from near sea level to about 5,000 ft. Common to fairly common everywhere but north-western quarter; fairly common to scarce in Panhandle in breeding season, though absent, except for casual lingerers, in winter; also usually absent in winter from Trans-Pecos and western Edwards Plateau east to Val Verde, Kimble, and Coleman cos. Though slowly decreasing throughout, recent information on nesting success lacking; was still nesting in Big Bend in 1970 (fide R. H. Wauer).

HAUNTS AND HABITS: The Cathartidae is strictly a New World family. Its six or seven members are large to immense eaglelike scavengers, awkward on the ground but impressive on the wing, with rather grotesquely wrinkled or warted—sometimes beautifully colored—naked heads. The Turkey Vulture is the most widespread and adaptable species of its family. The realm of *Cathartes aura* is the sky, where it soars tirelessly in search of carrion below. At times birds, singly or with other vultures, are seen perched on a bare tree limb, on a post, or standing at a dead animal.

The Turkey Vulture is more adept at soaring than is the Black. Wings held dihedrally, it can move for miles without a stroke if air currents are just right. In this V-shaped posture, the bird at times lists from side to side. In winter, individuals leave colder parts of the United States where a carcass is likely to freeze.

Western Turkey Vulture populations are more migratory than those in the east—quite the opposite of the habit of most North American bird species. Some birds travel as far as 3,500 miles to their wintering grounds. Such a trip, carried out entirely diurnally, ordinarily takes about two weeks; hence, a bird averages about nine hours flying time a day at 40 m.p.h. During this journey little or no food is consumed.

This hunter begins its aerial search for carrion late in the morning when dawn mists have cleared and the sun's heat has sufficiently activated thermal updrafts. Keen sight leads the Turkey Vulture to food in open country, while its sense of smell—plus perhaps the sight and sound of buzzing flies—directs it to odoriferous animal remains in dense vegetation. At a rotting carcass, this strong-beaked bird is a skilled feeder, but it cannot transport objects in its weak talons and rarely flies away with food in its bill. Since survival is largely dependent on unpredictable supplies of carrion, the Turkey Vulture must conserve energy whenever possible; thus, at night its body temperature drops from 38° C. to 34° C.; individuals awake with



a shiver in the morning which helps raise temperature to normal daytime level.

Hisses, grunts, and growls, emitted usually in mild squabbles over a carcass, are the only vocalizations of the Turkey Vulture. Its slowly flapping wings make a muffled swishing sound.

CHANGES: As befits a high-soaring bird, the Turkey Vulture is sinking slowly and gracefully.

Audubon Christmas Bird Counts indicate the decline at Turkey Vulture concentration points along the Texas Gulf coast. At Houston, upper coast, average numbers of individuals seen per Christmas count in five-year periods were: 75.2, years 1951-55; 67.6, 1956-60; 57.4, 1961-65; 31.2, 1966-70. At Aransas National Wildlife Refuge, central coast, the averages were: 138.6 (only 3 counts), 1951-55; 107.2, 1956-60; 436.6, 1961-65; 220.8, 1966-70. At Laguna Atascosa National Wildlife Refuge, lower coast, averages were: 104.6, 1951-55; 71.6, 1956-60; 72.5 (only 4 counts), 1961-65; 40.0, 1966-70. Actual Turkey Vultures seen on 1970 Christmas counts were 24 at Houston, 115 at Aransas, and 1 at Laguna Atascosa.

Real diminution of *Cathartes aura* is doubtless somewhat greater than the figures indicate. Since there are more Christmas counters every year, more and more birds get counted; it is quite possible for a slightly declining species to show greater numbers of individuals each year. However, the same source of number distortion applies to Black Vulture figures (see CHANGES section of *Coragyps*), since counts of the two species were made by the same people at the same locations. The conclusion is clear: The Turkey Vulture is declining moderately; the Black Vulture drastically.

Reasons for superior survival powers of *Cathartes aura* are fairly obvious. The Turkey Vulture is a far better sailplane than is the Black, and it is also more migratory in habit. This means that, both daily and yearly, the present species is able to cover more ground in its search for increasingly scarce food, nesting sites, and roosts. In addition, the Turkey Vulture has a good sense of smell (as is indicated both by behavior and by the well-developed olfactory lobe on its brain); the Black Vulture, like most bird species, almost lacks a sense of smell. The TV thus has two means of finding nourishment, while the BV is limited to one. Until the mid-twentieth century this was not a handicap for the Black, but it definitely is now, since ranchers and hunters no longer leave many cattle and deer corpses lying about.

DETAILED ACCOUNT: THREE SUBSPECIES

MEXICAN TURKEY VULTURE, *Cathartes aura aura* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage*: Similar to *C. a. teter* (see below), but decidedly smaller.

MEASUREMENTS: *Adult male*: Wing, 458.0-497.1 (average, 481.3) mm.; tail, 225.1-255.0 (245.6); bill (culmen from cere), 22.1-23.9 (23.1); height of bill at cere, 14.5-15.5 (15.0); tarsus, 59.4-65.0 (62.7); middle toe without claw, 58.9-67.1 (62.0). *Adult female*: Wing, 462.0-495.0 (482.1); tail, 230.1-

256.0 (240.0); bill, 21.6-24.9 (23.6); height of bill, 15.0-15.5 (15.2); tarsus, 57.9-67.1 (62.0); middle toe, 57.4-67.1 (62.7).

RANGE: Baja California, s. Arizona, s. New Mexico, and Trans-Pecos and lower Rio Grande plains of Texas, south through Mexico and Central America to n. Colombia, and from s. Florida to n.w. Bahamas, Cuba, Isle of Pines, Jamaica, Hispaniola, and Puerto Rico (introduced from Cuba ca. 1880).

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 5,000 ft. Collected northwest to Jeff Davis, Brewster, and Pecos, east to Nueces, south to Cameron cos. Common.

NESTING: *Nest*: In woodlands or open country, about cliffs, caves, or deserted buildings; sometimes in colonies; on ground, in crevices of rocks, arroyos, in hollow stumps, under logs, between trunks of large trees, in stubs of trees, or in old nests of hawks, even as much as 50 ft. or more above ground; eggs sometimes laid on bare ground, at other times on small quantity of leaves, decayed wood, trash, leaves, chips, and other rubbish; usually small amount of material used without lining. *Eggs*: 1-3, usually 2, mostly elliptical ovate, also elongate ovate, cylindrical ovate, sometimes oval; smooth, but not glossy; cream white, bluish white, yellowish white, greenish white, light cream color, or light drab; spotted and blotched with various shades of brown, including chocolate and reddish brown, occasionally with small dots and lines of dull red; shell markings consist of spots and blotches of drab, lilac, and lavender gray; average size, 68.6 × 47.0 mm.

WESTERN TURKEY VULTURE, *Cathartes aura teter* Friedmann

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Head and upper neck practically bare, but sparsely covered with short blackish bristles; lower hindneck and back glossy metallic bluish or greenish black, feathers with duller edgings; lower back, rump, and upper tail-coverts clove brown; tail fuscous or fuscous black; wings fuscous black to clove brown, inner webs of secondaries between drab and wood brown, edges pale brownish white; wing-coverts dull black or fuscous black, with broad edges of clove brown, buff, or sepia; lower parts black, anteriorly with metallic greenish gloss, posteriorly clove brown or olive brown; lining of wing fuscous black or clove brown. Bill ivory white; cere lake red or reddish flesh color; iris grayish brown, raw umber, raw sienna, or broccoli brown; head and naked part of neck crimson or reddish flesh color, deepest on forehead and hind head; band of whitish papillae on forehead; legs and feet dull yellowish white, cream color, or flesh color; claws dull black or blackish clove brown. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults but somewhat less dull, and with more metallic gloss. *First nuptial*: Acquired by wear from first winter. Similar to nuptial adults. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to nuptial adults, but light edgings of upper parts darker and duller, and naked skin of head and neck brownish black, blackish neutral gray, or slate black. Bill dull black; iris light yellowish brown or raw sienna; tarsus and toes brownish or grayish white. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. White, except for bare blackish anterior part of head. *Natal*: Body partly feathered with white down; skin blackish. Iris almost black.

MEASUREMENTS: *Adult male*: Wing, 495.0-530.1 (average, 508.8) mm.; tail, 245.1-271.0 (258.8); bill (culmen from cere), 22.1-25.4 (24.1); height of bill at cere, 14.5-17.0 (15.7); tarsus, 58.9-68.1 (64.3); middle toe without claw, 57.9-67.1 (63.0). *Adult female*: Wing, 486.9-534.9 (506.5); tail, 246.1-280.9 (262.6); bill, 22.1-25.9 (24.4); height of bill, 15.0-17.0 (16.0); tarsus, 58.9-72.9 (65.0); middle toe, 62.0-70.1 (65.3).

RANGE: S. British Columbia and s. Saskatchewan to w. Ontario, south to California, c. Arizona, c. New Mexico, and Texas. Winters chiefly from n. California and Nebraska through Mexico and Central America to Panama.

TEXAS: *Breeding*: Altitudinal range, near sea level to 3,600 ft., probably higher. Collected north to Randall, east to Cooke

(eggs), Harrison (eggs), and Jefferson (eggs), south to Refugio (eggs), west to Tom Green (eggs) cos. Common. *Winter* (largely withdraws from Panhandle): Taken outside breeding range in San Patricio (Mar. 1), Kleberg (Mar. 16), and Cameron (Mar. 1) cos. Common.

NESTING: Similar to that of *C. a. aura*.

EASTERN TURKEY VULTURE, *Cathartes aura septentrionalis* Wied

DESCRIPTION: *Adults, nuptial plumage*: Like *C. a. aura* and *C. a. teter* but much larger than either, especially the former.

MEASUREMENTS: *Adult male*: Wing, 518.0–550.0 (average, 535.9) mm.; tail, 252.0–298.0 (271.0); bill (culmen from cere), 24.0–25.0 (24.4); height of bill at cere, 15.0–16.5 (15.8); tarsus, 65.0–71.0 (68.1); middle toe without claw, 60.0–71.0 (64.4). *Adult female*: Wing, 527.0–559.0 (545.8); tail, 272.0–294.0 (283.6); bill, 24.0–26.0 (25.0); height of bill, 15.0–17.5 (16.3); tarsus, 70.0–75.0 (72.8); middle toe, 63.5–70.0 (66.1).

RANGE: S. Michigan and s.e. Ontario to Massachusetts, south to Louisiana and c. Florida. Winters chiefly from s. Ohio and c. Maryland to Louisiana and Florida.

TEXAS: *Accidental*: Bird found dead (specimen?): Tarrant Co., Benbrook Lake, Clear Fork of Trinity River, 1½ mi. southwest of Fort Worth (May 21, 1955, identified by W. M. Pulich).

BLACK VULTURE, *Coragyps atratus* (Bechstein)

SPECIES ACCOUNT

A stockier bird than the Turkey Vulture, with longer, thinner beak; blackish (not reddish) bare skin on head and neck; broader, shorter wings; stubbier, square tail; longer legs. In flight, reveals conspicuous white patch on both wing surfaces at base of primaries (not silvery flight feathers); also, flaps are frequent and glides usually brief. Length, 25½ in.; wingspan, 4¾ ft.; weight, 5¼ lbs.

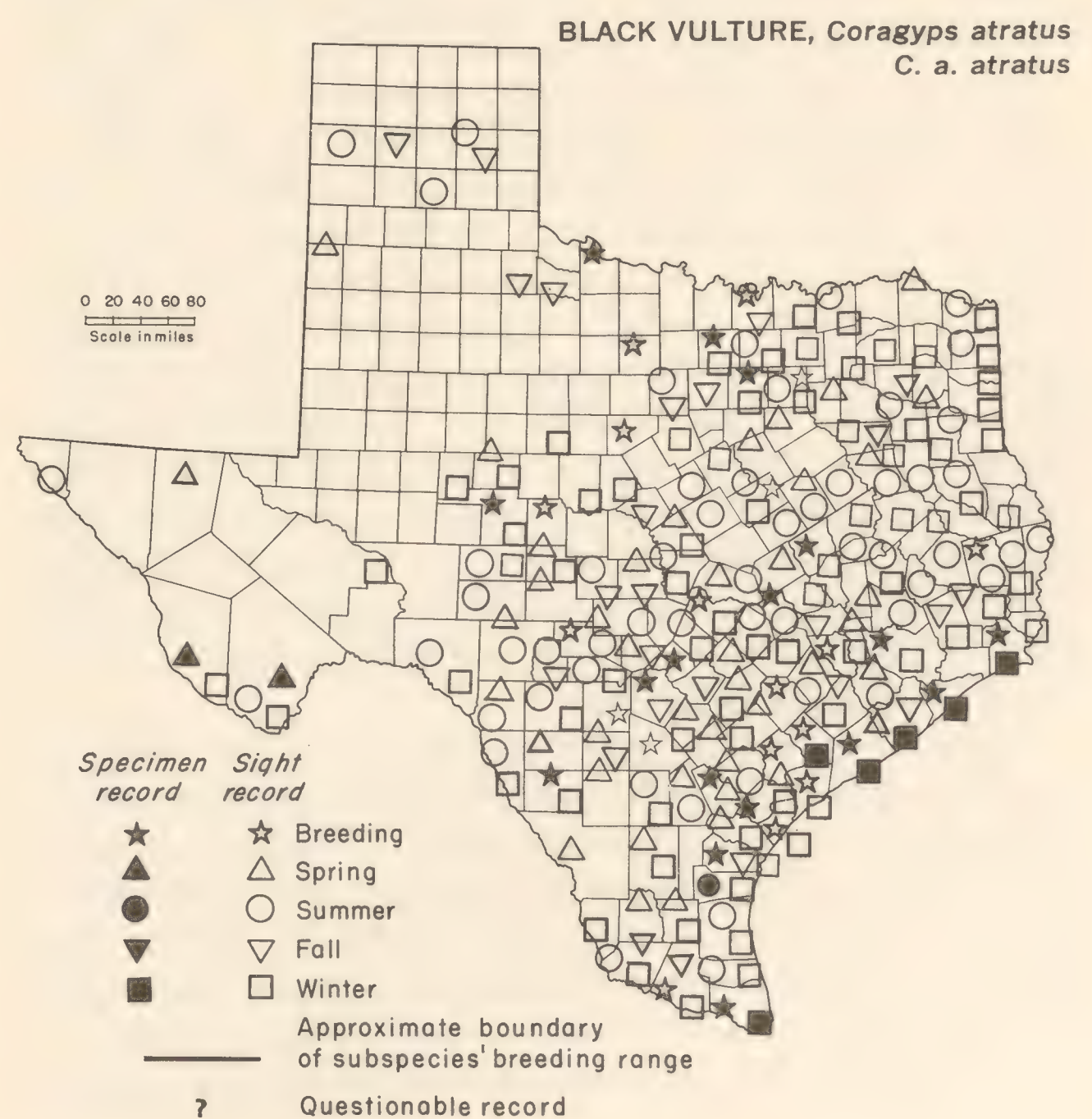
RANGE: Arizona (but not New Mexico) to Maryland and District of Columbia, south through U.S. Gulf states, Mexico, Central America, and South America to Chile and c. Argentina.

TEXAS: (See map.) *Resident* (largely): Breeds, late Jan. to Aug. (eggs, Jan. 28 to July 29; young in nest, Apr. 4 to Aug. 21) from near sea level to about 2,000 ft. Fairly common—formerly very common verging on abundant—to uncommon and decreasing in south Texas, eastern third, and on Edwards Plateau west to Tom Green Co.; casual in Panhandle and Trans-Pecos (except along Rio Grande in Big Bend, where uncommon). Recent successful nestings in Bexar Co., San Antonio (single nests, 1968–1970, J. A. Middleton). Formerly bred northwest of present range to Wise, Young, and Wilbarger cos. (latest: Wilbarger Co., Vernon, eggs taken, Apr. 21, 1930, R. L. More).

HAUNTS AND HABITS: The Black Vulture is a scavenger of hot, often humid country. In most places south of the United States, it is more common than the Turkey Vulture. It is probably more numerous than any other bird of prey in the Western Hemisphere. This status may soon change, however, since the species is declining in the United States and northern Mexico. *Coragyps atratus*, like vultures in general, prefers fairly open country, where chances of sighting food are

better than in deep forests. However, it is not averse to trees and is, in fact, more of a woods bird than is the Turkey Vulture. In tropical regions, Blacks supplement their carrion diet with nuts of oil palm, avocados, and other ripe or rotting fruit and vegetables. The Black Vulture is rather more gregarious than *Cathartes aura*. Both species at times feed together, but not without some disputing. As a rule, squabbles over a carcass are won by the Black, although it in turn yields to eagles and caracaras.

This stocky, short-tailed vulture is neither as graceful nor as sustained a flier as is the Turkey Vulture. Not built to utilize air currents efficiently, the Black moves with quick, labored flaps and brief, clumsy glides; in a stiff breeze, however, it can sail well. Often it flies to great heights to scan the countryside for food. If something is spied, it may dive rather swiftly or slowly circle lower and lower. Garbage dumps, slaughter houses, and highways are standard foraging places for both vultures, although in “developed” nations, such as the United States, they seem to eat more carrion and less garbage. Nowadays an observer usually has to go far south of the border to witness the classical scene wherein *zopilotes* perch on tombstones while they digest entrails from the neighboring abattoir. *Coragyps atratus* is quite ungainly and slow on the ground; if hurried, it staggers and hops as it spreads and flops its wings. A very weak-clawed bird, it can carry no food, so must eat when and where it finds carcasses; bites are torn off with its long, hooked beak while the bird braces itself firmly with tail and legs. Its tail feathers, used as a prop, are consequently often worn and appear ragged edged. In addition to carrion, offal, and excrement, this vulture occasionally takes eggs or young of sea



turtles or birds, such as herons and cormorants, also piglets, newborn calves, and other young or defenseless animals.

Black Vultures infrequently hiss, grunt, and emit muffled barking noises. Their flapping wings produce a heavy *whoof, whoof, whoof* sound.

CHANGES: One of the least noticed yet major changes in Texas bird life since 1950 is the decline of the Black Vulture. Formerly probably the most numerous of all large native land birds throughout the eastern half of the state, it is now (1972) drastically reduced in most of its old haunts.

Audubon Christmas Bird Counts indicate the diminution at Black Vulture concentration points along the Gulf coast. At Houston, upper coast, average numbers of individuals seen per Christmas count in five-year periods were: 69.4, years 1951-55; 58.4, 1956-60; 22.5, 1961-65; 7.4, 1966-70. At Aransas National Wildlife Refuge, central coast, the averages were: 56.6 (only 3 counts), 1951-55; 122.6, 1956-60; 365.0, 1961-65; 105.2, 1966-70. At Laguna Atascosa National Wildlife Refuge, lower coast, averages were: 244.8, 1951-55; 145.2, 1956-60; 67.5 (only 4 counts), 1961-65; 7.4, 1966-70. Actual birds seen on 1970 Christmas counts were 3 at Houston, 76 at Aransas, and zero at Laguna Atascosa. This last nadir showing is particularly ironic in view of the fact that Laguna Atascosa scored high count in the nation with 529 Black Vultures in 1952.

The senior editor, an old vulture watcher of some forty years' experience in Texas, has some suggestions on possible reasons for *Coragyps* vanishment. Few birds were more hated by Texas ranchers than the Black Vulture. Along with the Turkey Vulture it was believed to spread livestock diseases (though this has not been proved conclusively); the Black was regarded as an especially vicious pecker of the eyes of newborn pigs, lambs, kids, and calves. In the first half of the twentieth century, thousands of vultures were slaughtered in "buzzard" traps. The procedure was to set up a large chicken-coop-like structure and throw a few dead jackrabbits inside for bait. Vultures would enter a small hole in the side of the trap. They would then be too stupid to find their way out again, even though *Coragyps* gets in and out of shallow nest caves without difficulty. The rancher would either let the birds starve to death after they had eaten the jackrabbits or he would come around occasionally and shoot or club the "buzzards." Oddly enough, about 75 percent of the trapped victims were Black Vultures, thus perhaps indicating that the Turkey Vulture is the smarter.

Probably a much more potent factor in decline was the elimination of most vulture food. Formerly, livestock diseases and blowfly larvae ("screw worms") yearly killed many domestic animals, and even deer, on the range. These carcasses would be left to be cleaned up by vultures. Since 1950, diseases and even blowflies have been brought largely under control, and nowadays the few animals that die on the range

are usually promptly burned or buried in the interests of sanitation. Hunters, too, seem more careful about retrieving deer they have mortally wounded. Coyotes and rodents are still being poisoned, but these toxic corpses are not healthy even for vultures to eat. Neither is it conducive to long life to try to exist on road kills; clumsy *Coragyps* is ill-suited for getting out of the way of automobiles, especially in a state where over six million passenger cars are licensed to whiz around at 70 m.p.h. In short, there are no longer enough large and safe dead animals lying about to support a dense vulture population.

In addition, the necessary secluded nest sites and roosts become more and more scarce, as increasing millions of Americans boom around everywhere in off-the-road vehicles. The Black Vulture, at least in most parts of Texas, is in much deeper trouble than the Turkey Vulture. For possible explanation of this situation, see the CHANGES section of *Cathartes aura*.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BLACK VULTURE, *Coragyps atratus atratus* (Bechstein)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Head and upper neck unfeathered; upper parts, wings, and tail chaetura black, outer few primaries fuscous black with pale yellowish shafts, these feathers much lighter brown, grayish, silvery gray, or whitish on under surface and at base; lower parts like upper surface but abdomen dull chaetura drab. Bill dull black or olive, but tip white; cere black; naked skin of head and upper part of neck dull black, brownish black, or blackish slate; iris light reddish brown or dark brown; legs and feet dirty white, bluish gray, or blackish slate; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, though rather less dull. *First nuptial*: Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to nuptial adults, but head without warty scales and covered with blackish down or bristly feathers; general plumage duller. Bill without white tip. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Head dull black, mostly bare; remainder of body covered with buff or dull light pinkish cinnamon down. *Natal*: Creamy white, except for blackish, mostly bare, head.

MEASUREMENTS: *Adult male*: Wing, 415.0-435.1 (average, 423.9) mm.; tail, 177.0-201.9 (190.0); bill (culmen from cere), 22.6-24.9 (23.6); height of bill at cere, 13.7-15.0 (14.0); tarsus, 80.0-89.4 (85.1); middle toe without claw, 75.4-79.0 (77.0). *Adult female*: Wing, 412.0-428.0 (421.6); tail, 181.1-195.1 (187.2); bill, 22.6-25.4 (23.4); height of bill, 13.5-15.0 (14.0); tarsus, 82.0-90.9 (85.9); middle toe, 71.1-79.0 (75.7).

RANGE: S. Arizona, Texas, e. Oklahoma, s. Indiana, e. West Virginia, Maryland, and District of Columbia, south through Mexico (including Cerralvo Island, Tres Mariás Islands), and Central America to Bolivia and Brazil.

TEXAS: *Resident*: Collected north to Tarrant (eggs), east to Robertson (eggs) and Jefferson, south to Cameron, west to Brewster, Presidio, and Tom Green (eggs) cos.; formerly northwest to Wise (eggs) and Wilbarger (eggs) cos.

NESTING: *Nest*: In river valleys, on islands in swamps or marshes, or in woodlands; on bare ground, under log, or in cavity in cliff, or shallow cave, exceptionally in hollow near top of tree, as much as 90 ft. from ground; eggs laid on dead leaves or other vegetation, or on bare ground without materials. *Eggs*: 1-3, usually 2; ovate to elliptical ovate, or elongate ovate, oc-

asionally fusiform; pale grayish green, dull white, bluish white, or cream color; with large blotches of dark reddish brown, and other shades of brown, and smaller shell markings of lilac and purplish drab, these markings mostly about larger end; average size, 76.5 × 52.1 mm.

CALIFORNIA CONDOR, *Gymnogyps californianus*
(Shaw)

An enormous vulture, the largest North American soaring bird. *Adult*: black plumage with bare orange head and neck; bird in flight shows white wing-linings. *Immature* (for first 4 or 5 years): appears generally blackish; has dark gray bare head (orange skin coloration begins at base of neck and spreads gradually over head); wing-linings extensively mottled with dark brown. Length, 46½ in.; wingspan, 9 ft.; weight, 21¾ lbs.

RANGE: S. California, in mountains at southern end

of San Joaquin Valley to Coast Ranges from Monterey Co. to Los Angeles Co. Formerly ranged from Washington to n. Baja California; prehistoric cave deposits have been found in Nevada, New Mexico, and Texas.

TEXAS: *Extirpated*: The evidence for its occurrence rests on the report by A. Wetmore and H. Friedmann (1933, *Condor* 25: 37) of a number of bones obtained in a cave on the southern peak of Mule Ear Peaks in s.w. Brewster Co. Twenty-seven bones and fragments were found by F. M. Setzler during the spring of 1932. Enough information was gleaned from these deposits to indicate that the bird was of common occurrence in the region 2,000 to 3,000 years ago. One of the leg bones was that of a young bird scarcely old enough to fly, evidence that the species bred at that time in the area. There are no other records for the state.

Kites, Hawks, and Eagles: Accipitridae

WHITE-TAILED KITE, *Elanus leucurus* (Vieillot)

SPECIES ACCOUNT

The only falcon-shaped hawk in s. United States with a white tail. *Adult*: pale gray above with black shoulders; white head, tail, under parts; in flight, reveals black patch on under wing-coverts near bend of wing. *Immature*: grayish brown mantle; rusty streaks on crown and breast; vague blackish subterminal band on tail. Length, 16 in.; wingspan, 3½ ft.; weight, 15 oz.

RANGE: California, s. Texas, Gulf coast of Mexico, Nicaragua, Costa Rica, and Panama, with breeding highly likely in Guatemala, British Honduras, Honduras, and El Salvador; also Venezuela and Surinam, and Bolivia and s. Brazil to n. Chile, n. Argentina, and Uruguay. Recent (since 1960) sightings in Georgia, Alabama, Florida, Baja California, San Luis Potosí, Oaxaca, and Chiapas.

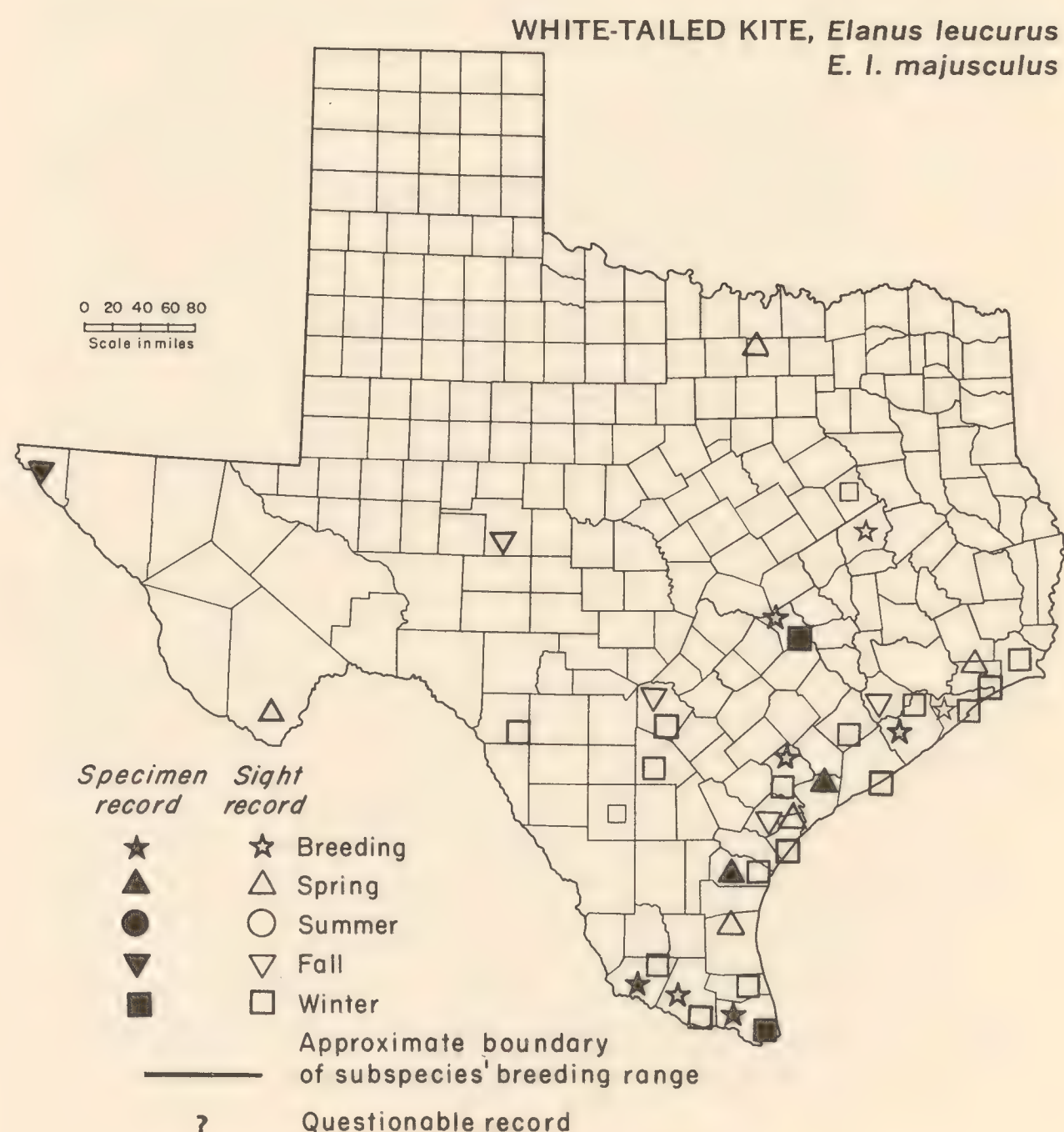
TEXAS: (See map.) *Breeding*: Mar. to Sept. (eggs, Mar. 18 to Aug. 21) from near sea level to—at least formerly—about 650 ft. Locally fairly common to scarce in extreme south Texas (Cameron and Hidalgo cos.). Two recent records on upper coast: Galveston Co., near Hitchcock (nest with eggs found, Apr., 1971, T. B. Feltner); Brazoria Co., San Bernard Nat. Wildlife Refuge (kites seen carrying nest material, May 8, 1970, R. J. Fleetwood). One recent summer record (no indication of breeding) from Brazoria Nat. Wildlife Refuge (pair present all summer, 1970, Fleetwood). Formerly bred upriver to Starr Co., Rio Grande City (eggs taken, May 26, 1903, for T. H. Jackson) and inland as far as Lee Co. (nest and eggs found, Apr. 11, 1890, K. Atkinson). However, in keeping with species' recent increase, breeding lately discovered inland: Leon Co., Trinity River (pair with nest found, spring 1973, David Wolf, C. D. Fisher). *Winter*: Mid-Sept. to late Apr. (extremes: Sept. 2, May 20). Locally fairly common to scarce in Cameron and Hidalgo cos.; scarce to rare on remainder of coast. Casual inland in south Texas (Bexar Co., Mar. 1, 1970, Mr. and Mrs. G. B. Harding; Atascosa Co., near Poteet, winter of 1970–71, Jean Bensmiller; between Eagle Pass and Del Rio, Dec. 27, 1959, R. A. Rylander), and in Trans-Pecos (Big Bend Nat. Park, Apr. 17, 1971, Mr. and Mrs. R. W. Forster, and Apr. 22, 1971, Jo Alys Downs, Francile D. Lord; El Paso, pair shot by Manuel Ahumada, early Oct., 1938, fide A. H. McLellan). Accidental in Denton Co., Lake Dallas (Apr. 2, 1949, A. E. Jourde); Freestone Co. (Jan. 4, 1972, J. C. Truett); and Tom Green Co., San Angelo (autumn, late 19th century, W. Lloyd).

HAUNTS AND HABITS: By far the largest family of

diurnal birds of prey, the Accipitridae contains a spectacular 205 members—all skillful hunters and graceful on the wing. Of this kite-hawk-eagle-harrier complex, 21 species are found in Texas more or less regularly. Many of these largely misunderstood birds are on the wane, especially in developed countries where they are being hunted, trapped, DDT-ed, otherwise poisoned, or left habitatless. The White-tailed Kite in the United States prior to the 1960's seemingly belonged to this general decline. However, the species from 1959 into the early 1970's has experienced an encouraging and rather dramatic comeback, especially on its California range; to a much lesser extent this increase has been witnessed in Texas.

This beautiful, impressively white bird, like its kite relatives, is a warm-weather raptor. Open, usually rather dry, slightly brushy savannah or agricultural country with scattered clumps of trees and a permanent water source are preferred haunts. Thus, the coastal plain in the extreme southern tip of the state—with its patches of grass, tilled fields, sand dunes, palm groves, and marshes, resacas, and willow-lined streams of the Rio Grande system—is primary White-tailed Kite country in the Lone Star State.

This long-winged hawk, appearing like a gull, flies with light and airy grace. Usually it displays an Osprey-like kink in its wing. It hunts at a moderate



height (50 to 70 ft.) above the ground—neither so high as a buteo nor so low as a harrier. When prey is sighted, it “stands” or “wind-hovers” in the air, often for thirty or so seconds, on motionless wings if the currents are right, but flapping if it must. Rather than stooping on its quarry with a swift falconlike dive, it lightly flutters downward, suggesting a parachutist, with wings held dihedrally and legs dangling. Despite this leisurely appearing descent, the White-tailed Kite seldom misses its target—usually a meadow (*Microtus*), white-footed (*Peromyscus*), or house (*Mus*) mouse. Wood rats, cotton rats, pocket gophers, ground squirrels, shrews, small snakes, lizards, and frogs are taken; also grasshoppers, beetles, crickets, and similar large insects. Two disgorged pellets found in February, 1962, near Edna (Jackson Co.), Texas, contained skulls, bone fragments, and hair from cotton rat (*Sigmodon hispidus*), short-tailed shrew (*Cryptotis parva*), and pygmy mouse (*Baiomys taylori*), according to D. B. McKey and C. A. Fischer (1972, *Bulletin Texas Ornithological Society* 5[1]: 10).

The shrill, spasmodic *keep keep keep* whistle of the White-tailed Kite expands to a higher pitched *kreek* or *kree-eeek* when the bird is alarmed.

CHANGES: Almost—but not quite—alone among the earth's birds of prey, the White-tailed Kite is increasing. In California and in Central America, this hawk's population has been exploding since 1955. (For details see E. Eisemann, 1971, *American Birds* 25: 529–536.)

In Texas, Whitetail increase during the 1960's was modest. Total individuals reported on Audubon Christmas Bird Counts in the Lone Star State were 9 in 1950, 11 in 1960, 15 in 1969, and 49 in 1970. In this same period, the Mississippi Kite made much more impressive advances—but after all, in the early days of the twentieth century it never sank so low as the White-tailed and Swallow-tailed kites. In California, Texas, and Latin America much new habitat has been created for the White-tailed Kite by man's massive deforestation, brush removal, and farming activities. *Elanus* catches mainly plant-eating rodents and *Ictinia* consumes mostly vegetarian insects; neither form of prey ordinarily carries as much pesticide residue as do fish and birds.

More elusive is the reason why the White-tailed Kite is exploding in California and barely creeping up in Texas. Possibly the resident, largely tropical *E. leucurus* is adversely affected by sudden, freezing cold snaps that sweep all of Texas but seldom occur in the California range of this kite. (The far-migrating Mississippi Kite does not suffer from Texas “blue northers,” since it is long gone by winter.) Human population density in California is higher than in Texas. This means more extensive and intensive agriculture, bigger garbage dumps, and very high numbers of rats and mice—all factors working in favor of the White-tailed Kite. However, even rodents in the former Golden State are loaded with pesticides, since the environment there is extremely heavily polluted. The amazing fact is that White-tailed Kite eggs in California, in spite of high pesticide content, are not thin shelled and

are hatching well (fide A.O.U. Conservation Committee, 1971, *Auk* 88: 908). Perhaps at last there has evolved one species of bird which, like many strains of house flies and cotton insects, thrives on DDT!

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN WHITE-TAILED KITE, *Elanus leucurus majusculus* Bangs and Penard

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Forehead grayish white; remainder of upper parts neutral gray, inclining to drab gray on central tail feathers; remainder of tail dull white; primaries deep neutral gray, somewhat brownish on inner webs; lesser and median wing-coverts dull black; remainder of upper surface of wings like back; sides of head, except for blackish spot in front of eye, white; lining of wing, except for single conspicuous spot of deep neutral gray, pure white like all lower parts. Bill black; cere chrome yellow, chamois, or cream buff; iris orange, rufous, chrome yellow, or dull buffy yellow; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial*: Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Top of head dull white broadly streaked with fuscous on hind portion; in general similar to nuptial adults but upper parts duller and clouded with fuscous and sepia; pileum broadly streaked with fuscous; back and scapulars hair brown or fuscous, feathers of latter broadly, those of back narrowly, tipped with dull white or cinnamon; gray of rump and upper tail-coverts more brownish than in adult, and feathers tipped with paler gray or dull white; tail duller gray on middle rectrices, with subterminal bar of mouse gray to neutral gray, reduced to spots on outer feathers, outer margin of outer two or three pairs from middle of tail washed with light mouse gray; primaries brownish slate, darker subterminally, and having broad tip of white; secondaries lighter and more purely grayish and broadly tipped with white; tertials darker than in adult (more brownish like scapulars) and tipped with white; greater wing-coverts like secondaries, and also tipped with white; middle and lesser coverts brownish black, median series tipped with white; lower surface white, but throat, jugulum, and breast streaked with olive brown and dull ochraceous tawny or cinnamon rufous, these markings almost confluent on jugulum. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Bluish slate. *Natal*: Upper parts vinaceous buff, lighter on sides of lower back; lower parts pale vinaceous buff, but verging to buffy white on chin and sides of breast.

MEASUREMENTS: *Adult male*: Wing, 294.9–318.0 (average, 310.1) mm.; tail, 172.0–183.1 (179.3); bill (culmen from cere), 16.5–20.1 (18.8); height of bill at base, 13.5–15.0 (14.2); tarsus, 38.1–40.9 (39.4); middle toe without claw, 27.9–31.0 (29.2). *Adult female*: Wing, 305.1–323.1 (314.7); tail, 175.0–183.1 (179.3); bill, 19.0–20.6 (19.8); height of bill, 13.7–14.5 (14.2); tarsus, 39.1–40.9 (40.1); middle toe, 27.9–32.0 (30.2).

RANGE: California, coastal Texas, Gulf coast of Mexico; formerly n. Baja California (but has reappeared here), c. Texas (also perhaps becoming reestablished, nested 1973), Oklahoma, Florida (with post-1960 reports), and South Carolina. Recent evidence of breeding in Nicaragua, Costa Rica, and Panama, probable breeding in Guatemala, British Honduras, Honduras, and El Salvador, and recent sightings in United States and Mexico undoubtedly all refer to this race (see species account).

TEXAS: *Breeding*: Collected in Cameron Co.; formerly in Starr (eggs), Nueces, and Calhoun cos. *Winter*: Taken in Cameron Co. (latest, Dec. 31, 1971); formerly in Lee Co. Birds shot (specimens?) in El Paso Co. (see species account).

NESTING: *Nest*: In swamps or woodlands, usually near water, often along streams; in tree or bush; rather frail platform of sticks, leaves, weed stalks, and similar materials; lined with grass, straw, and pieces of bark. *Eggs*: 3–5, usually 4; ovate to oval or nearly spherical; smooth, not glossy; dull cream white, much

blotched and spotted with shades of reddish brown, more heavily on larger end; average size, 41.9 × 33.5 mm.

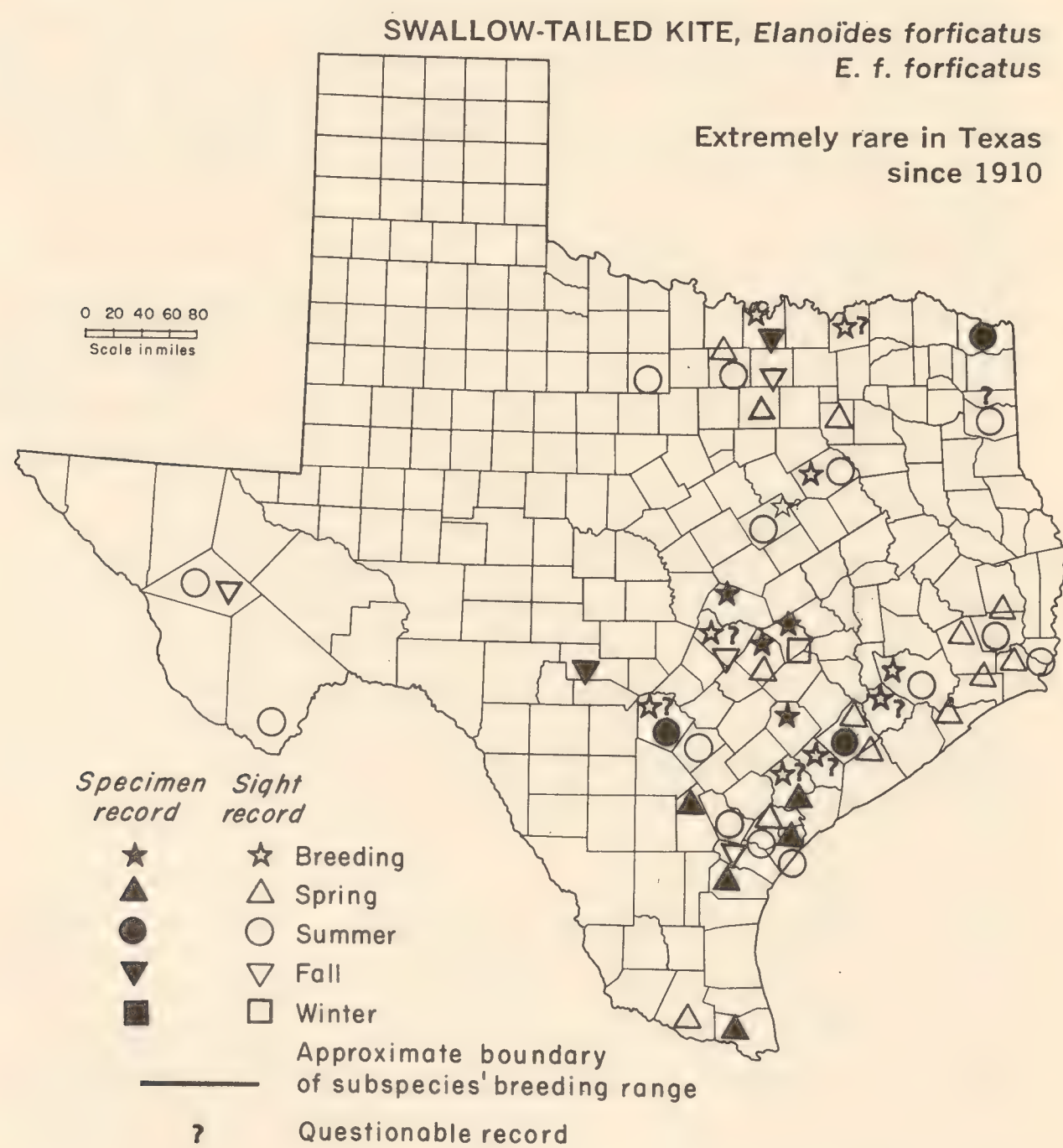
SWALLOW-TAILED KITE, *Elanoides forficatus*
(Linnaeus)

SPECIES ACCOUNT

A medium-sized hawk with long pointed wings; very long (14½ in.), deeply forked (8½) tail. White head, hindneck, rump-patch, and under parts; black back, wings, tail; in flight, reveals white wing-linings. Length, 23 in.; wingspan, 4 ft.; weight, 1 lb.

RANGE: Very locally from Louisiana to Florida and South Carolina; and from extreme s. Mexico and Central America to n. Argentina. Formerly bred throughout Mississippi Valley; most U.S. nesters since 1910 have been in Florida. Winters chiefly in South America; occasionally a few in Florida.

TEXAS: (See map.) *Breeding* (formerly): Late Feb. to early July (eggs, Mar. 10 to June 7) from near sea level to 750 ft. Formerly very common to uncommon over much of eastern half, with highest density on coastal prairie and along timbered watercourses west to Balcones Escarpment and north to Navarro Co.; uncommon to scarce farther north. Decline in breeding population seems to have begun ca. 1900 and was virtually completed by 1910; last mention of breeding: Harris Co. (rare summer resident, breeding 1911–1914, G. F. Simmons). Summer sightings since 1914: Harrison Co., Baldwin (2 seen, June 11, 1920, A. R. Cahn); McLennan Co., Dry Pond (flock of nearly 100, June 3, 1922, J. K. Strecker); and Aransas Co., Rockport (1 on June 27, 1946, Connie Hagar). *Migration:* Mid-Mar. to mid-May; mid-Aug.



to late Oct. (extremes: Mar. 13, May 28; Aug. 5, Nov. 14). Rare and irregular in spring on upper and central coasts; casual in spring on lower coast and in extreme south Texas; one recent record from Tarrant Co. (May 15, 1965, Midge Randolph, Flo Stanfield). Casual in fall (only 14 records since 1914), with more sightings from inland eastern half than from coast; has wandered to Trans-Pecos (Davis Mts., 1 present, Aug. 23–Sept. 4, 1966, Pansy Espy, et al.; 1 at Big Bend Nat. Park, Aug. 5, 1969, R. H. Wauer).

HAUNTS AND HABITS: The Swallow-tailed Kite attains its eminence aloft where, like a giant black-and-white Barn Swallow, it drifts, circles, and dives with incredible ease and grace. These aerial displays, however, are largely a thing of the past in North America. Riverbottom forests with adjacent semiprairie land, freshwater marshes that skirt large lakes, and pine glades with cypress swamps are prime haunts; in southern Florida this kite frequently sails over mangroves. Singly, but preferably in small parties, it soars throughout the day; seldom is it observed at a perch. Formerly in large flocks—now in remnant bands—Swallowtails migrate in fall from the United States.

In search of prey, the Swallow-tailed Kite cruises at treetop level or low over a marsh or watercourse. With unbelievable swiftness, it whips by foliage or slips to the ground to pluck an insect, lizard, or frog. The senior editor recalls a scene of great beauty in the Mexican state of Chiapas. Here several of these most graceful hawks glided about wet pines—the trunks and main branches of which were festooned with bromeliads and yellow orchids—apparently searching for small frogs and lizards which reside in epiphytes. The Swallowtail also seizes snakes from their sunning logs and talons dragonflies and other large insects in mid-air. At times individuals sail to great heights to obtain high-flying insects. In Texas, this kite has been observed eating field mice, young Mockingbirds, and Painted Buntings. Prey is eaten while the kite is on the wing; the bird bows its head and with its sharply hooked beak tears off morsels from the meat carried in its claws. To drink or bathe, the Swallowtail swoops down to a river or lake, dips in its bill, skims its belly, washes its feet, or draws its tail in the water as it continues to fly near the surface.

The call of the Swallow-tailed Kite has been variously described as a shrill, piercing *e-e-e-e*, *kii-ki-ki*, or *pee-pee-pee*. Birds in a flock often twitter softly to one another as they fly.

CHANGES: Nowadays (1960's into 1970's), most people tend to blame wildlife decimation on pesticides, herbicides, and industrial wastes. The decline of the Swallow-tailed Kite should serve as warning that there are additional agencies of death and destruction in the world. Largely between 1900 and 1910, long before the days of massive planetary pollution, the United States lost practically all its Swallowtails except those in Florida.

Apparently, Texas nesting pairs persisted longest

in three widely separated localities. In the vicinity of Giddings (Lee Co.) J. W. Brown collected eggs on May 19, and June 7, 1894. At Long Lake (s.w. Anderson Co.) H. C. Oberholser reported this kite numerous and feeding grown young from July 18 to 24, 1902. The Long Lake occurrence seems to constitute the last definite report of breeding within the state. There is, however, mention without specific data of breeding near Houston (Harris Co.) as late as 1911 to 1914 (G. F. Simmons).

No convincing cause for the rapid disappearance of the Texas Swallowtail population is apparent. However, the species seems to require very tall trees—up to two hundred feet high—for nesting, with extensive open land, which is more or less wet, for hunting dragonflies, frogs, and snakes. It could very well be that during the first decade of the twentieth century too many big trees were felled for lumber and too much adjacent prairie developed for farms, cattle pastures, and pig pens. In the Florida Everglades, the one U.S. locality where *Elanoides forficatus* still flourishes, some good habitat yet remains.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN SWALLOW-TAILED KITE, *Elanoides forficatus forficatus* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Head, nape, rump, basal portion of inner secondaries, lining of wing, and entire lower surface white; back and inner lesser wing-coverts metallic dull deep violet; remainder of upper parts, including tail, blackish slate or slate black, lightest on scapulars, and with metallic olive green and purplish reflections on scapulars, wings, and tail. Bill black, basal half of mandible and basal portion of maxilla bluish plumbeous or bluish white; interior of mouth cobalt blue; cere, corner of mouth, and naked eyelids bluish plumbeous; iris dark brown or hazel; feet lighter plumbeous or bluish white; claws grayish brown. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired probably by complete pre-nuptial molt from first winter. Similar to nuptial adults but more brownish, with greenish metallic sheen, glaucous bloom on feathers lacking; wing, tail, and primary coverts with narrow white tips. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Similar to adults but duller; head, neck, and lower parts pinkish buff or cinnamon, feathers with darker shaft streaks; back and wings dull black, latter with metallic dull olive greenish sheen, upper back duller and slightly mixed with pinkish cinnamon. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. White or buffy white. *Natal:* White.

MEASUREMENTS: *Adult male:* Wing, 422.9–436.1 (average, 431.3) mm.; tail, 327.9–342.9 (334.2); bill (culmen from cere), 19.0–20.1 (19.6); height of bill at base, 14.0–16.0 (15.0); tarsus, 32.0–33.0 (32.8); middle toe without claw, 26.9–29.4 (28.2). *Adult female:* Wing, 436.1–445.0 (440.2); tail, 342.9–370.1 (355.9); bill, 19.0–21.1 (20.1); height of bill, 14.7–16.0 (15.2); tarsus, 32.0–33.0 (32.8); middle toe, 28.4–29.9 (29.2).

RANGE: Very locally from Louisiana to Florida and South Carolina; formerly e. Texas, and north to Minnesota, Wisconsin, Ohio, and North Carolina. Winters chiefly in South America; occasionally a few in Florida.

TEXAS: *Breeding* (formerly): Collected north to Cooke, east to Bowie, south to Wharton, west to Bexar and Williamson (eggs) cos. (see species account). *Migration:* Collected north to Cooke, south to Nueces and Cameron, west to Kerr cos.

NESTING: *Nest:* In marsh, swamp, or other woodlands; usually near top of tall tree; formerly occasionally as high as 200 ft.

above the ground; fairly well made bowl of sticks, weed stalks, moss, and pine needles; lined with a little moss, small twigs, and feathers. *Eggs:* 1–4, usually 2; rounded ovate to elliptical ovate, or oval; white, bluish white, greenish white, or yellowish white; spotted, sometimes heavily, with various shades of brown, and with lavender shell markings; average size, 47.0 × 37.1 mm.

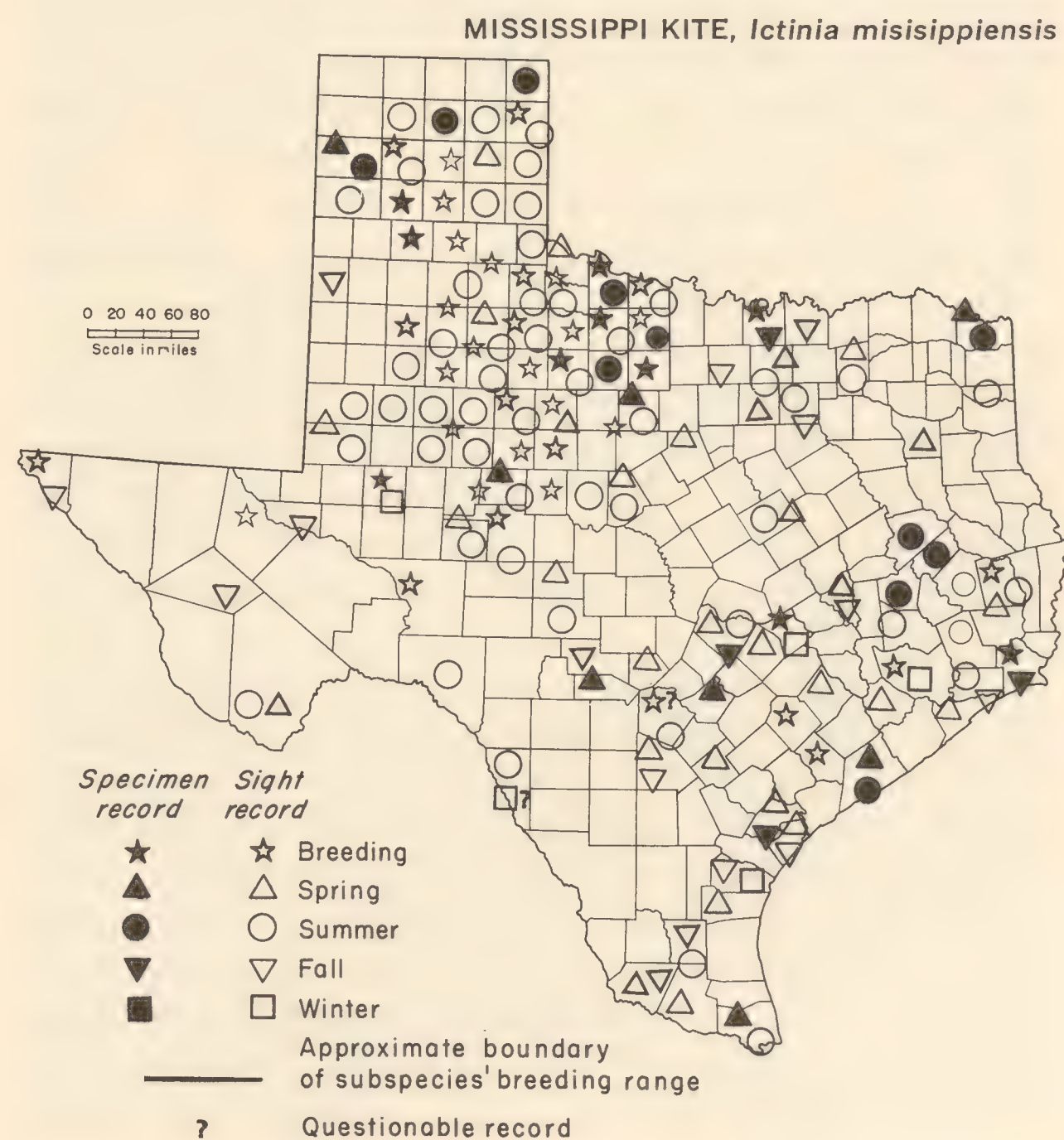
MISSISSIPPI KITE, *Ictinia mississippiensis* (Wilson)

SPECIES ACCOUNT

A falcon-shaped hawk with black tail (vaguely grayish-banded in immature). *Adult:* pale gray head, hind-neck, band on wing (secondaries), and under parts; dark gray mantle; black lores and primaries; in flight, pale gray secondaries (almost white on trailing edge) as well as black tail are conclusive. *Immature:* blackish-streaked whitish head; blackish back, tipped with russet and white; heavily brown-streaked below. Length, 14½ in.; wingspan, 35; weight, 10 oz.

RANGE: Locally from Kansas, s.e. Colorado, Missouri, Tennessee, and South Carolina, south to Texas, Gulf states, and n.w. Florida; formerly s. Illinois and s. Indiana. Apparently winters chiefly in s. South America; a very few in s. Texas and Florida.

TEXAS: (See map.) *Breeding:* Late Apr. to late Aug. (eggs, May 3 to July 12; young in nest, May 23 to Aug. 27) from near sea level to about 3,800 ft. Locally very common to uncommon over most of northwest portion of state east to Wichita Falls, south to Abilene and San Angelo, west in diminishing numbers to about 102nd meridian (fledgling just learning to fly seen in Midland Co., Aug. 24, 1970, second breeding record for the locality, fide J. C. Henderson); casual in Trans-Pecos (nest found along Pecos River near Sheffield, 1912, J. S. Ligon; adults feeding 1 of 2 young, another imma-



ture collected, Balmorhea Lake, Aug. 17, 1969, H. M. Ohlendorf and T. Mulhagen; pair carrying sticks, May 19, 1958, and young on nest, Aug. 27, 1960, El Paso Co., R. Fisk; 3 young raised, El Paso Co., 1970, fide L. R. Wolfe). Formerly (prior to ca. 1913) bred regularly east of present range to Bowie Co. in north; from Balcones Escarpment (San Antonio and Austin) southeast to central and upper coasts. Recent nesting record: Harris Co., Houston (nest built, May 6–15, 1970, with incubation starting on May 17, Mr. and Mrs. W. J. Holmes, Norma Oates, et al.). Recent breeding suspected in Polk and Liberty cos., along Trinity River (adult pairs observed, summer 1972, C. D. Fisher). Recent summer observations in northeast corner: Bowie Co., between Clear Lake on Red River floodplain and town of Hooks (total of 9 birds, 8 in adult plumage, 1 first year bird, June 16, 1973, C. D. Fisher, Suzanne Winckler); Red River Co., Pecan Bayou (1 adult, carrying food or nesting material, June 17, 1973, Fisher, Winckler). *Migration*: Mid-Apr. to mid-May; late Aug. to early Oct. (extremes: Mar. 6, May 28; July 18, Dec. 7). Irregularly very common (sometimes locally abundant) to scarce from breeding range southeast to Gulf coast and Rio Grande delta; scarce to rare over northeast quarter of state; casual straggler as far west as El Paso. More often seen in spring than fall. *Winter*: Five localities: Lee Co., Giddings (Jan. 3, 9, and Feb. 16, 1895, G. W. Erwin); Lee Co., Nunnsville (Jan. 5, 7, and 25, 1897, Erwin); Harris Co., Baytown (Dec. 26, 1948, C. E. Buehner, J. M. Heiser); San Patricio Co., Welder Wildlife Refuge (Jan. 20, 1960, Clarence Cottam); Midland Co., Midland (Feb. 17, 1970, H. L. Williams).

HAUNTS AND HABITS: In summer, Mississippi Kites—appearing like big-headed gray gulls—float over both humid and semiarid flatlands: baldcypress (*Taxodium distichum*) swamps and pinelands in the Gulf states, scrubby oak country in Oklahoma, and mesquite (*Prosopis glandulosa*)—sand sagebrush (*Artemisia filifolia*) rangeland in northwestern Texas. Optimum nesting sites are in cottonwood (*Populus*) timber along sandy Panhandle rivers, such as the Canadian, and shelter belts, planted largely in the 1930's, on the adjacent plains. Nowadays, this kite is the only Texas raptor numerous enough to form colonies; as late as 1970 at least one group contained about one hundred nests—frequently several in one tree—on forty acres. This kite appears to be gregarious at all seasons of the year, although it has been little studied on its South American wintering grounds.

The gentle disposition of the Mississippi Kite, coupled with its lack of interest in game birds or poultry, causes it to be liked by otherwise antihawk people—even some Texas rangemen admire it! *Ictinia mississippiensis* was the favorite bird of the late R. L. More of Vernon, noted ranch business manager, veteran student of north Texas nesting birds, and friend of H. C. Oberholser. Adding considerably to a Mississippi pair's charm are their two chicks. These are brooded in a breeze-swept treetop nest, which the parents reline

daily with fresh green leaves. Nest sanitation is thoroughgoing; there is none of the usual raptor nest carrion smell. The fluffy white downies look alert, cute, and cuddly, but one suspects that their sharp little hawk beaks and wee claws might go into action should they be fondled. Defensive at the nest, a pair will drive off intruders, especially crows and jays; however, this seems to be the only time, except in play, that this bird shows aggression toward other birds.

Though perhaps not so elegant in the air as a Swallowtail, the Mississippi nonetheless displays the easy grace and buoyance of the kites. Migrants, usually in flocks, fly rather leisurely, often at great heights, with periods of deep flapping and light sailing; like Turkey Vultures, with which they sometimes travel, they circle in ascending air currents to gain altitude. This kite seizes large insects—grasshoppers, cicadas, beetles, and dragonflies—in its talons and eats them, all the while on the wing. Individuals of *Ictinia mississippiensis* and its neotropical relative, the Plumbeous Kite, *I. plumbea*, often have a sticky discolored spot on the under tail-coverts; this is because half-eaten prey is often carried in the talons and pressed next to the tail as the bird flies. When wind currents are unfavorable, the Mississippi flycatches from a perch; it dashes out to grab a passing insect, then returns to eat it. Small bands of this kite also trail a plow or reaping machine to catch the bugs it churns up. When grass fires break out on the southern Great Plains, Mississippi Kites quickly gather. They course back and forth in the air above and just in front of the advancing flames where they deftly snatch fire-flushed grasshoppers and cicadas.

The Mississippi Kite is seldom vocal away from the nest; here birds sound a *phew-phew* or *t-wheew* in alarm or protest. Mating birds sometimes chipper to each other.

CHANGES: All kites in Texas suffered decline around 1900. The White-tailed Kite began showing signs of resurgence in the state during the late 1960's, but the Mississippi, less depleted than its relative, began to rise again in the 1950's.

The turn of the century saw *Ictinia mississippiensis* virtually retired from the reproduction business in the eastern third of Texas. Counties lost in this portion were: Cooke (last nesting, June 1, 1889, G. H. Ragsdale); Bowie (common, probably nesting, June 19–July 12, 1888, B. T. Gault); Tyler (rather rare, July 6–13, 1902, N. Hollister; nest found, date unknown, by W. L. McDaniel); Jefferson (eggs several times taken, late 19th century, R. E. Rachford); Harris, near Houston (nests observed, 1881, H. Nehrling); Jackson (nests found prior to 1905, J. D. Mitchell); Lavaca (nests located, 1861–1866, Mitchell); and Lee, at Giddings (eggs taken, May 22, 1886, and May 16, 1890, J. A. Singley). Near the city of Austin the species was thought to breed in 1890 (C. D. Oldright). At San Antonio the famous European ornithologist H. E. Dresser reported this kite a “not common” breeder; he saw an adult and young during the summer of 1864.

It is of interest that most of the recent (since 1957) new nesting localities—Midland, Balmorhea Lake shore in Reeves County, and El Paso—are in decidedly arid areas; the only definite resumption of nesting within the old humid eastern Texas range was at Houston in 1970 (but see TEXAS section for 1972 and 1973 records). Nowadays most of the Mississippi Kites on the planet first see the light of day in northwestern Texas and adjacent Oklahoma. In 1811, when the father of American ornithology, Alexander Wilson, discovered the species along the Mississippi near Natchez, this kite was primarily a humidland nester. In 1853, S. W. Woodhouse reported *Ictinia mississippiensis* to be especially abundant along the Arkansas River in Indian Territory, but since 1900, Oklahoma nesters have moved to drier localities west of this river (G. M. Sutton). The Mississippi Kite's feat of shifting, in only half a century, its nesting metropolis from damp forest landscapes of the southeastern United States to the dry southwestern Great Plains is quite without precedent among American birds. In striking contrast is the Black-billed Magpie, *Pica pica*. This supposedly resourceful, even intelligent, bird, in the over 15,000 years (as indicated by fossil evidence in Texas and elsewhere) it has resided in the Western Hemisphere, has not been able to adapt to well-watered eastern North America.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Crown pallid neutral gray; nape neutral gray; back and scapulars deep neutral gray, the latter with concealed spots or bars of white; upper tail-coverts dark neutral gray; tail dull black with greenish sheen; primaries fuscous black, all but two outermost with greater portion of inner webs (except tips), together with outer webs next to shafts, bay; lesser wing-coverts dark neutral gray; rest of exposed surface of wings neutral gray, except broad tips of inner secondaries which are white and outer webs of most secondaries which are pallid neutral gray; posterior part of lores dull black; chin whitish; sides of head and of throat pallid neutral gray, shading on posterior lower parts to neutral gray; lining of wing neutral gray. Bill, cere, eyelids, and interior of mouth deep black; corner of mouth orange-red; iris lake red or dark red; legs orange or orange-red, but lower part of tarsus and large scales of feet brown. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but top and sides of head and neck darker, as are also secondaries; bay color on primaries of somewhat less extent. *Adult male and female, winter:* Acquired by complete postnuptial molt. Similar to corresponding sex of nuptial adults. *Male, third winter:* Acquired by complete postnuptial molt. Like adult male. *Male, second nuptial:* Acquired by wear from second winter. Like nuptial adult male, but with very little or almost no bay on primaries and with none on outermost four. *Male, second winter:* Acquired by complete postnuptial molt. Like second nuptial male. *Female, third winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Female, second nuptial:* Acquired by wear from second winter. Like nuptial adult female, but lacking bay color on primaries. *Female, second winter:* Acquired by complete postnuptial molt. Indistinguishable from second nuptial female. *Male and female, first nuptial:* Acquired by partial prenuptial molt. Resembling nuptial adult female, but primaries with no bay color on inner or outer webs; outermost primary with large white area on basal part of inner web; secondaries not lighter than primaries; rectrices like those of first winter; posterior lower parts with some white. *Male and female,*

first winter (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Pileum chaetura black, narrowly streaked with white or buffy white; back fuscous black; rump and upper tail-coverts chaetura black; back, scapulars, rump, and upper tail-coverts chaetura drab or chaetura black, feathers with broad concealed bars of white and conspicuous tips of russet, cinnamon, or dull white; tail dull black with slight greenish sheen, and usually with three obscure bars of gray on middle feathers, and imperfect bars of white on inner webs of remaining rectrices; primaries dull black, tipped with buffy white, outermost with large white area on basal portion of inner web; secondaries deep neutral gray or brownish neutral gray broadly tipped with white; wing-coverts fuscous black tipped with russet or cinnamon; lining of wing mottled with hair brown, bister, cinnamon, dull ochraceous, tawny, and cinnamon buff; lower parts buffy white, pale buff, or cinnamon buff, palest on chin and streaked everywhere with chaetura black, bister, or clove brown. Bill black; interior of mouth dull white; iris red or yellow; legs and feet yellow. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Probably similar to natal. *Natal:* Pure white, a faint buffy brown spot on hindneck; back and wings with tinge of light brown; region about eyes dull gray. Bill dull blue-gray; iris grayish brown; eyelids dull gray; cere dull brownish orange; corners of mouth light orange; feet light yellowish orange; claws gray.

MEASUREMENTS: *Adult male:* Wing, 286.0–305.1 (average, 294.9) mm.; tail, 149.1–166.1 (157.2); bill (culmen from cere), 14.5–15.5 (15.0); height of bill at base, 13.0–15.2 (14.2); tarsus, 35.1–37.1 (36.1); middle toe without claw, 26.4–26.9 (26.7). *Adult female:* Wing, 300.0–315.0 (309.6); tail, 153.9–172.0 (163.1); bill, 15.0–17.0 (16.0); height of bill, 13.5–14.5 (14.2); tarsus, 36.6–40.4 (38.4); middle toe, 27.9–28.9 (28.2).

TEXAS: *Breeding:* Collected north to Lipscomb, east to Wilbarger, Archer, and Stephens, south to Coke, west to Reeves, Randall (eggs), and Oldham cos.; formerly (19th century) east to Cooke and Bowie, south to Lee (eggs) and Jefferson (eggs) cos. (see species account). *Migration:* Collected northwest to Oldham, east to Bowie and Jefferson, south to Cameron, west to Bandera cos.

NESTING: *Nest:* In marshes, swamps, shelter belts, or fringes of timber along streams, in top of tree, formerly occasionally as high as 135 ft. above ground; bowl made of sticks and weed stalks; rather compactly lined with moss or other soft material, often with green leaves. *Eggs:* 1–3, usually 2; ovate, rounded ovate, to nearly oval; pale bluish white or white; unmarked or with very faint spots of pale brown; average size, 40.9 × 34.0 mm.

[EVERGLADE KITE, *Rostrhamus sociabilis* (Vieillot)]

Snail Kite of many authors. A large kite with long broad wings; wide square tail (may be slightly notched when folded); slender, sharply hooked black beak; red cere, facial skin, and eyes; long red-orange legs. *Male:* black, except for an extensive white patch (visible on both surfaces) at base of white-tipped tail. *Female:* mainly brownish black with whitish chin and sometimes line behind eye; white or rufous mottlings on breast; vague rufous bars on thighs; tail pattern essentially as in male. *Immature:* buff-tipped blackish brown above with whitish-streaked forehead and hindneck; distinct white line behind eye; whitish throat; brown-streaked tawny or buffy below; tail as in adult. Length, 15¼–18 in.; wingspan, ca. 3¾ ft.; weight (*R. s. sociabilis* from Surinam), 10–14 oz.

RANGE: Everglades of s. Florida (chiefly Lake Okeechobee and Loxahatchee Refuge), Cuba, Isle of Pines,

Veracruz, Tabasco, and Campeche, thence through Central America and South America to Bolivia, n.e. Argentina, and Uruguay.

TEXAS: *Hypothetical*: One careful sighting by observers familiar with the species in southeastern Mexico: Cameron Co., south Padre Island (1 on Oct. 4, 1971, J. C. and Jimmie Arvin; bird was seen early in the morning after nocturnal thunderstorm flying slowly and low over marsh toward Boca Chica). Since apparently the sole food of *Rostrhamus sociabilis* is the apple snail (*Pomacea*), unavailable in Texas, this hawk is not kept in captivity in the state; therefore, it is likely that the individual observed by the Arvins was a weather-displaced wild bird.]

HOOK-BILLED KITE, *Chondrohierax uncinatus* (Temminck)

SPECIES ACCOUNT

Large, heavy, sharply hooked bill is important field mark. Plumage highly variable according to sex, phase, age, and individual. "Normal" phase adult male: dark blue-gray above; blackish tail, narrowly tipped with white, and crossed with broad subterminal band—gray on upper surface, white underneath; a similar band near base of tail less distinct; finely white-barred gray below; under surface of primaries boldly barred with white. "Normal" adult female: brown above, except for gray crown and sides of head and rufous collar on hindneck; white-barred rufous below; tail-bands less distinct than in male. Black phase adults (sexes alike): all black, except for one broad white or pale gray band on tail; narrow white tip on tail and white edgings on upper tail-coverts scarcely visible in field. Soft parts of adults: white eye; bright pea green cere and skin around eye; black maxilla; dull green mandible; yellow to orange feet. "Normal" immature: brownish black above; three or four narrow, pale grayish bands on tail (female has bands a bit wider and more brownish); white collar around neck adjoining white under parts, the latter sometimes finely black-barred, particularly on thighs and sides. Black phase immature: essentially all brownish black (crown with much concealed white); gray-tipped tail has two or three gray bands, these bordered with white. Young birds (both phases) have brown eyes. Natal: long white down, tinged pink on crown, back, and wings; black bill and eyes; yellow cere and feet. Length, 15–17 in.; wingspan, 32 (rough estimate of bird in flight); weight, 8¼–10½ oz.

RANGE: Tropical Mexico from s. Sinaloa (including Tres Mariás Islands) and s. Tamaulipas, south to e. Peru, Bolivia, n. Argentina, and Paraguay; also Grenada and Trinidad. Accidental in s. Texas.

TEXAS: *Accidental*: One record, first for United States: Hidalgo Co., Santa Ana Nat. Wildlife Refuge (nesting pair, May, 1964, Raymond J. Fleetwood, resident manager of refuge at the time). Birds dis-

covered on May 1; later the same day they were photographed by John L. Hamilton, of St. Joseph, Missouri. On May 3, Fleetwood found the nest; it contained 3 off-white downy young about a week old. On May 5, Fleetwood returned to find that all birds had disappeared. He collected the empty nest on May 14 and sent it to the U.S. National Museum. Color slides of the birds were shown to the following ornithologists who confirmed the identification: John W. Aldrich, Dean Amadon, Emmet R. Blake, Eugene Eisenmann, George H. Lowery, Jr., Robert M. Mengel, Roger T. Peterson, Lester L. Short, Jr., George M. Sutton, Melvin A. Traylor, and Alexander Wetmore. (For further details and photograph of this astounding occurrence see R. J. Fleetwood, J. L. Hamilton, 1967, *Auk* 84: 598–601.)

HAUNTS AND HABITS: The Hook-billed Kite is a solitary, but rather tame, reclusive hawk found from sea level to at least 6,000 feet in South America—only to 3,000 feet in Mexico. The species inhabits dense tropical and subtropical forests; sometimes, however, it occurs in open woodlands. In some localities it frequents swampy areas, while in other places it inhabits dry vegetation. In most parts of its range it is uncommon to rare. A nest discovered in Surinam was a shallow bowl of dried twigs placed in a tree (*Erythrina* sp.) shading coffee plants. The two eggs were spherical, white, and blotched with chocolate brown; average size, 45 × 37 mm. *C. uncinatus* may perch from upper canopy or mid-branches of a tree down to thick understory or even on the ground. The one pair found in the United States habitually perched on dead trees. A pile of empty snail shells on the forest floor should prompt an upward investigation, as the Hookbill often drops remains of its preferred food—land and arboreal snails—to the foot of its regular feeding perch and also beneath its nest. The snail eaten in Texas was *Bulimulus alternatus*, a common dryland species.

Though rather sedentary, the Hookbill at times soars. In the sky its long wings—constricted near the body and broadening to the rounded tips—and long narrow tail help identify this raptor. More usual flight consists of flaps alternating with short glides, wings held horizontally. The Hook-billed Kite's heavy bill is not specialized for extracting snails from shells as are the slender decurved bills of the Everglade Kite, *Rostrhamus sociabilis*, and the Slender-billed Kite, *R. hamatus*. Snail shells found at the Santa Ana nest site had been bitten off at the ends. *C. uncinatus* also eats frogs, salamanders, and insects, including caterpillars.

Hook-billed Kites harassing a Black Hawk were heard to scream and chatter harshly (D. Amadon). A musical whistle is also uttered. The Texas birds' apparent alarm note was an almost constant "loud, rattling call descending in pitch" (R. J. Fleetwood, J. L. Hamilton).

NOTE: The Texas individuals presumably belonged to *C. u. aquilonis*, the only race which ranges as far north as Mexico. However, it is not good practice to

attempt to identify subspecies from field observations or photographs.

GOSHAWK, *Accipiter gentilis* (Linnaeus)

SPECIES ACCOUNT

Northern Goshawk of some recent authors. A large hawk with short rounded wings; long round-tipped tail. *Adult*: gray (rather pale in American birds) above; blackish on crown and on side of head; bold whitish streak over eye; several blackish bands (sub-terminal one broadest) on narrowly white-tipped tail; whitish below, vermiculated with gray except on fluffy white crissum. *Immature*: buff-tipped brown above (paler as a rule than young Cooper's); narrow whitish streak over eye; tail-bands more clearly defined than in adult; heavily brown-streaked buffy below. Length, 22 in. (male), 23¾ (female); wingspan, 3½ ft. (male), 3¾ (female); weight, 1½ lbs. (male), 2¼ (female).

RANGE: N. North America and Eurasia, south to n. highland Mexico, n.e. United States, Mediterranean region, Iran, Mongolia, and Japan; also e. Tibet. Somewhat migratory in northern portion of range, with a tendency toward cyclic irruptions.

TEXAS: (See map.) *Winter*: Nov. to Apr. (extremes: Nov. 9, Apr. 25). Extremely rare and irregular over northern two-thirds. Casual on central coast: Aransas Co., Rockport (Nov. 9, 1936, and Feb. 14–18, 1950, Connie Hagar). Accidental on upper coast: Harris Co., Sheldon Reservoir (Jan. 12, 1973, V. L. Emanuel, T. B. Feltner). One unconfirmed report of immature bird from Santa Ana Nat. Wildlife Refuge (Aug. 28, 1969). Summer sightings in Chisos Mts. (July 19, 1956,

Aug. 12, 1967, and June 19–20, 1971, fide R. H. Wauer) may represent postnuptial wandering by birds nesting in mountains of northern Mexico, or even breeding in Chisos Mts. (substantiation lacking).

HAUNTS AND HABITS: The Goshawk is a fearless and dashing hunter of northern woodlands. In the Old World it frequents deciduous as well as evergreen forests. In northern America, however, it apparently nests only where coniferous trees—Douglasfir, true firs, and spruces—dominate the landscape; in Mexico it nests in the highest sierras where tall fir (*Abies religiosa*), pine, and oak grow. In some winters, usually in nine- to eleven-year cycles, large parties from the north invade the midwestern and central states, apparently in search of food.

This largest of North American accipiters typifies its genus: It is a secretive forest dweller which hunts about clearings for its preferred avian prey. The long tail and short rounded wings adapt it for speedy, controlled, flap-and-sail flights amid trees. In remote stands of woods, a pair builds its bulky bark-lined stick nest, usually a new one each year, high (20 to 60 ft.) in a coniferous or deciduous tree. This large (3 to 5 ft. wide) platform, wherein lie the three or four bluish or greenish white eggs, is supported by the trunk and horizontal limbs.

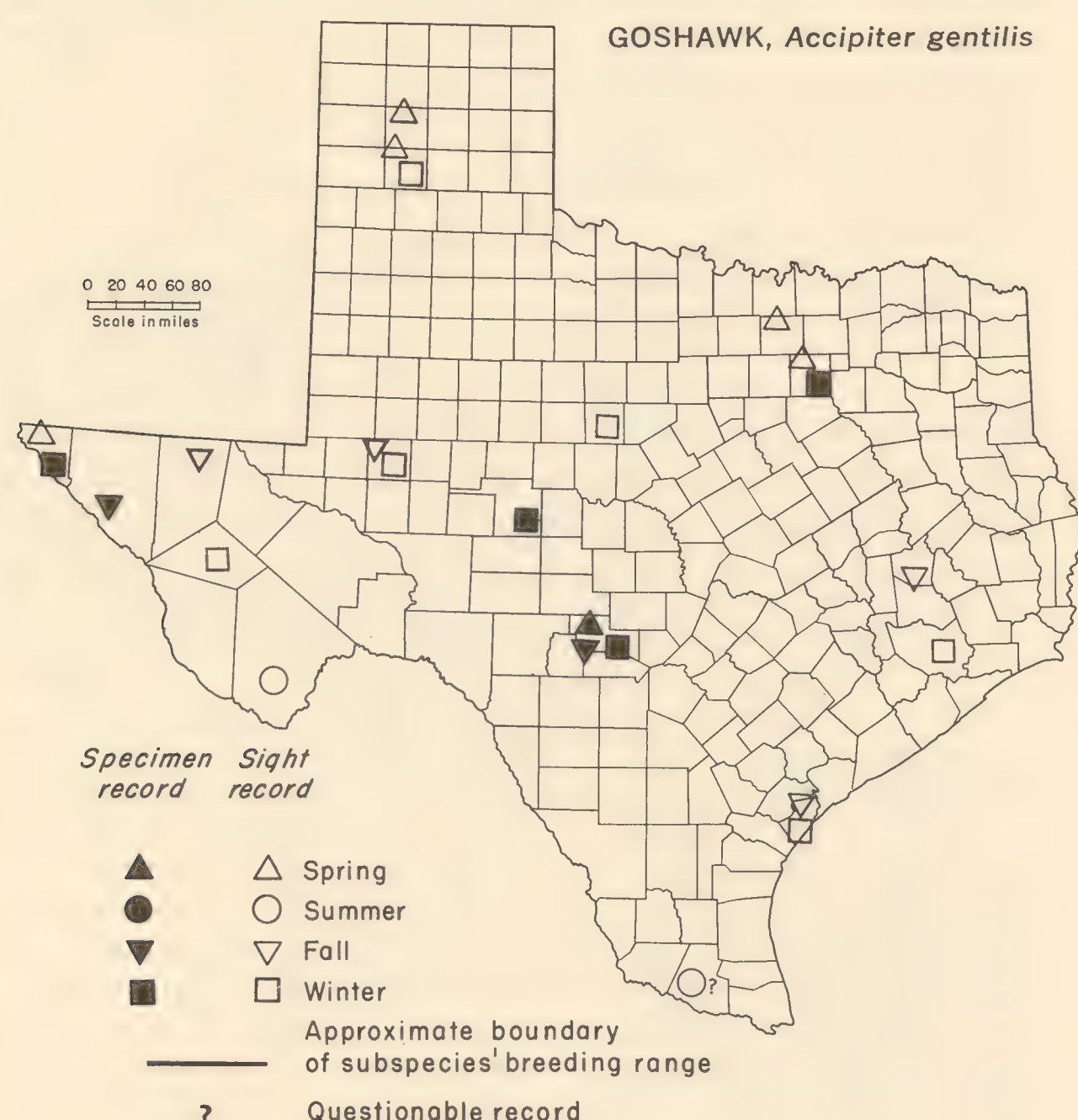
Goshawk hunts generally begin from an interior limb high in a tree. The hawk surprises its prey when it dives with amazing swiftness from its camouflaged perch. An animal that attempts to escape is usually chased down on the ground as the hawk recklessly leaps along and finally pounces on its victim. The crush of its powerful talons is fatal. Ground-dwelling birds—grouse, ptarmigan, quail—and ducks are most frequently taken; but the Goshawk also hunts woodpeckers, Blue and other jays, Belted Kingfishers, other birds, and an assortment of mammals—chipmunks, weasels, squirrels (red, gray, and ground), hares, rabbits, mice, and in far northern parts, lemmings. The Goshawk is exceptionally fierce and bold at the nest and will drive back intruders—even people—with loud cries and mid-air swipes and blows which have been known to rip clothing and draw blood.

Accipiter gentilis is usually silent, except at the nest; here both male and female sound loud, strident, hoarse *kak kak kak kak* or *kuk kuk kuk kuk* alarms. Undisturbed pairs, apparently during courtship, converse with clear, high-pitched, querulous *kee-a-ah's*.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN GOSHAWK, *Accipiter gentilis atricapillus* (Wilson)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Pileum blackish mouse gray, with rather darker obscure streaks and edgings; remainder of upper parts deep mouse gray or deep neutral gray, feathers with darker shaft stripes and some with slightly darker margins; upper tail-coverts neutral gray; tail mouse gray to deep mouse gray, outer feathers brownish hair brown with several broad bars of fuscous or fuscous black; wing-quills fuscous, barred with paler fuscous or drab, chiefly on inner webs; wing-coverts like back; broad superciliary stripe dull white, streaked with dark mouse gray;



sides of head like crown; sides of neck like hindneck; lower parts dull white, irregularly barred and mottled with mouse gray or grayish hair brown, feathers streaked with mouse gray or chae-tura drab; crissum immaculate or nearly so; axillars and lining of wing similar to anterior lower surface. Bill bluish black, but cinereous at base; cere and inside of mouth wax yellow, olive buff, or dull green; iris poppy red, yellow, yellowish brown, orange ochraceous, or dark brown; legs and feet creamy yellow, straw yellow, lemon yellow, or chrome yellow; claws black. *Adult female, nuptial*: Similar to nuptial adult male but averaging a little more brownish on upper surface; with slightly heavier vermiculations below. *Adult male and female, winter*: Acquired by complete postnuptial molt. Like corresponding sex of nuptial adults. *Male and female, second nuptial*: Acquired by wear from second winter. Similar to nuptial adult, but crown with white streaks; jugulum and breast broadly streaked, barred, or spotted with brownish black, these markings much coarser than those of adult. *Male and female, second winter*: Acquired by complete postnuptial molt. Similar to second nuptial. *Male and female, first nuptial*: Acquired by wear from first winter. *Male and female, first winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Upper parts fuscous to fuscous black with buffy white and cinnamon streaks, these broadest and most conspicuous on nape, feathers of scapulars with broad, mostly concealed, bars of buffy white or cinnamon buff; tail broadly barred with dull light hair brown; wings like upper parts; primaries and secondaries broadly barred on inner webs with buffy white or pale pinkish buff and drab or dull light hair brown on outer webs; lower parts, including lining of wing, buffy white, washed with cinnamon buff or pale cinnamon buff and heavily streaked with fuscous. Bill dark brown, but base of mandible yellow; cere green, sulphur yellow, or greenish yellow; iris straw yellow or antimony yellow; feet dull yellow; claws dull brown or chamois.

MEASUREMENTS: *Adult male*: Wing, 311.9–354.1 (average, 325.9) mm.; tail, 230.1–279.9 (245.9); bill (culmen from cere), 20.6–25.9 (22.4); height of bill at base, 18.5–20.6 (19.8); tarsus, 67.1–82.6 (75.2); middle toe without claw, 43.9–54.6 (48.3). *Adult female*: Wing, 321.1–368.0 (347.2); tail, 250.0–301.0 (278.6); bill, 21.6–25.9 (23.9); height of bill, 19.6–21.6 (20.9); tarsus, 73.4–95.0 (81.3); middle toe, 44.4–55.9 (50.0).

RANGE: N.w. Alaska, n. Manitoba, and n. Labrador, south to s.e. Wyoming, Minnesota, c. Michigan, New York, Pennsylvania, and w. Maryland. Winters chiefly from c. Alaska, s. Mackenzie, and Labrador irregularly to California, Chihuahua, Durango, Texas, Missouri, and Virginia, casually to Florida.

TEXAS: *Winter*: Five specimens: El Paso Co., Cañutillo (ca. Jan. 13, 1918, B. Bradley; identified by A. H. McLellan); Dallas Co., Dallas (1 on Feb. 14, 1937, W. A. Mayer; 3 others, dates unknown, mounted by Mayer, identified by H. C. Oberholser). Birds shot (specimens?): Hudspeth Co., Esperanza (ca. Nov. 30, 1917, R. B. Prescott; identified by McLellan); Kerr Co. (3 in Nov., 1916, and 2 ca. Apr. 1, 1917, H. Lacey); Cooke Co., near Gainesville (prior to 1889, G. H. Ragsdale; identified by William Brewster).

WESTERN GOSHAWK, *Accipiter gentilis striatulus* (Ridgway)

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *A. g. atricapillus*, but darker above and somewhat darker below. *Male and female, first winter* (juvenile plumage of most authors): Similar to first winter of *A. g. atricapillus*, but decidedly darker above; more heavily dark-streaked below.

MEASUREMENTS: *Adult male*: Wing, 312.9–335.0 (average, 319.3) mm.; tail, 266.6–250.0 (240.3); bill (culmen from cere), 20.1–23.1 (21.4); height of bill at base, 18.0–19.0 (18.8); tarsus, 71.9–76.5 (75.4); middle toe without claw, 41.9–51.1 (45.7). *Adult female*: Wing, 342.1–362.0 (352.1); tail, 271.0–317.5 (294.4); bill, 22.6–24.4 (23.1); height of bill, 20.1–22.1 (20.9); tarsus, 76.2–80.0 (78.2); middle toe, 45.0–48.5 (46.8).

RANGE: S. Alaska and s. Yukon, south (including Queen Charlotte Islands) to c. California, s.e. Arizona, and n. New

Mexico; also locally in n. Jalisco, and probably sporadically in Chihuahua and Durango. Winters chiefly from s.e. Alaska irregularly to s. California, Chihuahua, Sinaloa, and Guerrero, casually to w. Texas.

TEXAS: *Winter*: Two specimens: Tom Green Co., near San Angelo (male, Dec., 1885, W. Lloyd; probably identified by Robert Ridgway); Kerr Co., Center Point (winter 1916–17, H. Lacey; identified by H. C. Oberholser).

SHARP-SHINNED HAWK, *Accipiter striatus* Vieillot

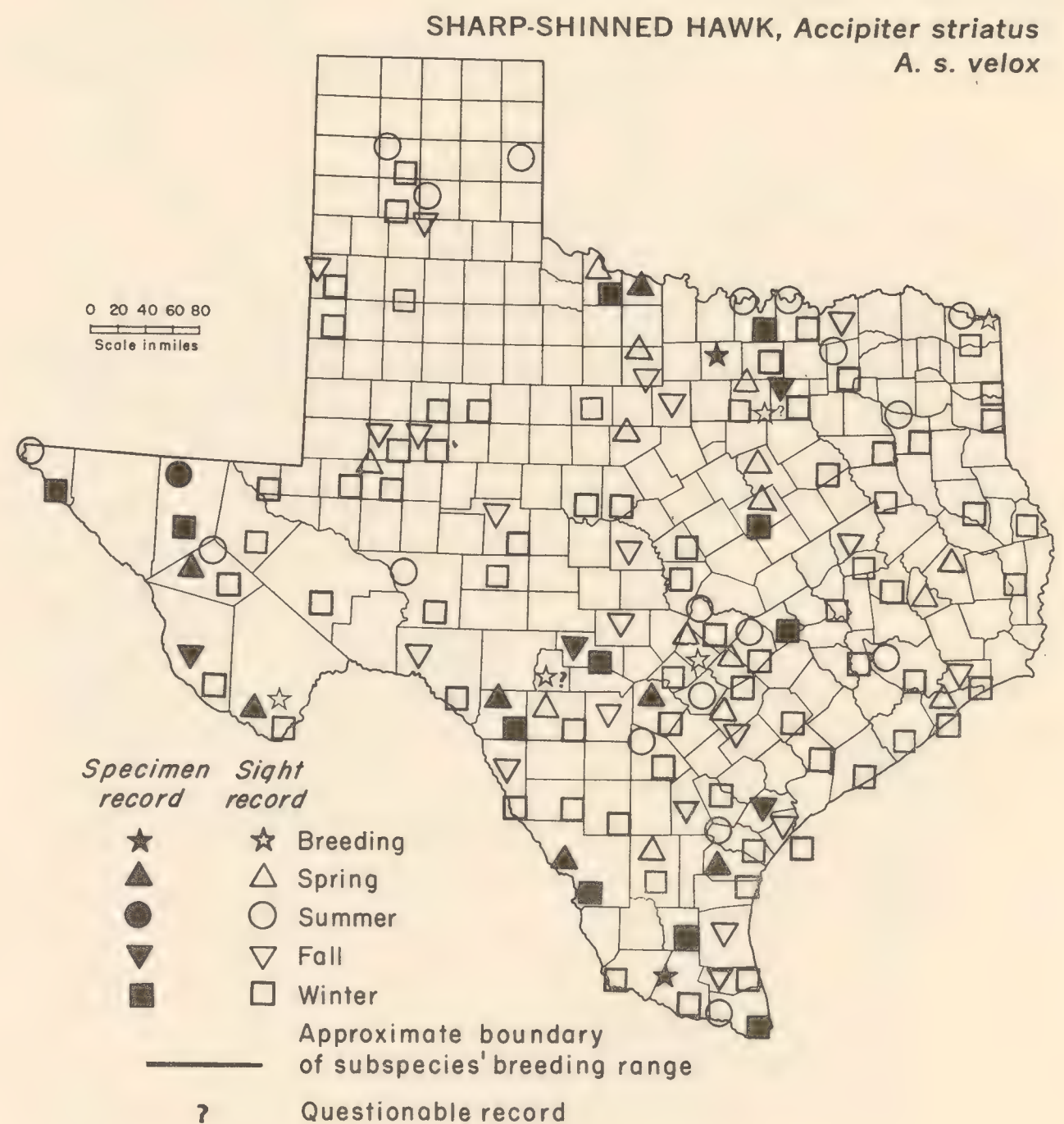
SPECIES ACCOUNT

See colorplate 3

A very small hawk with short rounded wings; long narrow square-tipped tail (may appear slightly notched in small male; vaguely roundish in large female). *Adult*: dark bluish gray above, blackish on crown; several blackish bands (subterminal one broadest) on narrowly white-tipped tail; cinnamon-barred white below, except for unmarked white crissum. *Immature*: dark brown above; suggestion of whitish streak over eye (fallible); heavily brown-streaked buffy below. Length, 11 in. (male), 13½ (female); wingspan, 22 (male), 25½ (female); weight, 6¼ oz. (male), 7 (female).

RANGE: N.w. Alaska to Newfoundland, south to s. California, Texas, and South Carolina, thence through mountains of mainland Mexico to Michoacán and Veracruz; also Cuba, Hispaniola, and Puerto Rico. Mainland birds winter chiefly from British Columbia and Nova Scotia to Panama (casually); also Bahamas (a few) and Greater Antilles (perhaps).

TEXAS: (See map.) *Breeding*: Apr. to Aug. (only one egg date, Apr. 30) from about 120 to 7,835 ft. Very rare and local in eastern half south to Real and Hays cos. (latest record: Hays Co., Wimberley, pair nested,



July, 1961, Hazel Green) and in mountains of Trans-Pecos (latest: Brewster Co., Chisos Mts., nests found Aug., 1966, and June, 1969, R. H. Wauer); accidental in Hidalgo Co. (2 eggs taken, 1878, J. C. Merrill; U.S. Nat. Museum collection). *Winter*: Mid-Sept. to early May (extremes: Aug. 20, May 18). Fairly common to scarce virtually throughout, though rare in sections where woodlands absent.

HAUNTS AND HABITS: Smallest of the three North American accipiters, or bird hawks, the Sharp-shinned Hawk seeks open woodlands, patches of trees, and thickets. This small but bold hunter cares little for wide open country and ventures there only on an infrequent chase of a pipit, longspur, or other prairie-dwelling bird. During the breeding and winter seasons, Sharpshins are usually seen singly or in pairs. However, groups of migrants, particularly in fall, join the spectacular hawk flights that pass along the major U.S. flyways. Since the species' center of abundance is in eastern Canada, the Atlantic route is usually the most heavily traversed by *A. striatus*; Hawk Mountain, Pennsylvania, one hundred miles west of New York City, is the most famous spot to view migrating "sharpies."

Flight, several quick flaps of the short wings interspersed with brief glides, is very fast and strong; the hawk maneuvers through thick brush with the aid of its long tail. The Sharpshin generally skulks on a leafy perch from where it drops swiftly on its unsuspecting prey. Also, it beats briskly and rather low through the woods; when it spies a quarry, it plummets to snatch its victim off a twig or from the ground. Sometimes, on the ground, this hawk even springs after a small bird or mammal in a series of long hops until it either makes a catch or abandons the chase. Standard avian prey are warblers and sparrows, but Sharpshins, especially large females, will take doves, woodpeckers, jays, thrashers, thrushes, and young chickens. Shrews, mice, young rabbits, frogs, lizards, and a few insects comprise about 30 percent of its diet. As is usual with accipiters, the female is often impressively larger than the male. The small male brings many tiny birds to the nest when the chicks are just hatched. Later, when the young outgrow their need of brooding by the female, she supplies them with bigger prey.

The Sharp-shinned Hawk's high, shrill *kik kik kik* are sounded in anger or alarm about the nest. A plaintive squeal, usually uttered by the male from his favored perch, is another call note and apparently is part of the pair's courtship and mating activities.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN SHARP-SHINNED HAWK, *Accipiter striatus velox* (Wilson)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts mostly mouse gray, feathers of occiput with concealed white bases; upper tail-coverts neutral gray; tail broadly barred with chaetura black and hair brown or neutral gray, and narrowly tipped with grayish white; primaries fuscous, broadly barred with fuscous black; secondaries

rather dark brownish mouse gray, inner edges white or pale buff, broadly barred with brownish dark mouse gray; tertials deep mouse gray with large concealed spots of white; greater coverts deep mouse gray; remainder of wing-coverts dark mouse gray; sides of head dull ochraceous, very narrowly streaked with fuscous; lower parts white, chin with very narrow shaft streaks of fuscous; breast and thighs heavily barred confluent with russet, tawny, and cinnamon rufous; lining of wing pale cinnamon buff, more or less spotted and slightly streaked with fuscous. Bill bluish plumbeous or russian blue, but terminal portion dull black; cere pinard yellow; corner of mouth and eye-ring light green or sulphine yellow; interior of mouth light cobalt blue; iris yellow or nopal red; feet and toes in front dull lemon yellow, posteriorly buff; claws black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to adult male but larger; duller and more brownish above; lighter below. Bill black, but base of mandible french gray; cere olive buff or olive yellow; iris yellow, reddish orange, or dragon blood red; legs and feet chrome yellow or maize yellow; claws black. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second nuptial:* Acquired by wear from second winter. Similar to nuptial adults, but upper parts duller, more brownish, feathers with some edgings of tawny; flanks darker. *Male and female, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial but rather darker, with somewhat broader edgings on feathers of upper surface. Iris scarlet vermilion. *Male and female, first nuptial:* Acquired by wear from first winter, with which it is identical, except for paler colors due to fading. *Male and female, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Upper parts fuscous, but with more or less of cinnamon admixture on crown and nape, crown fuscous black, many of the feathers tipped with tawny; tail rufescent hair brown with four narrow bars of fuscous black, and very narrowly tipped with grayish or buffy white; wing-quills fuscous, barred with fuscous black, inner spaces on basal portions of inner webs becoming white or buffy white; secondaries very slightly tipped with dull light cinnamon; remainder of wings, including superior wing-coverts, fuscous, tipped with cinnamon or pale buff; lower parts white or buffy white streaked or spotted with verona brown, sanford brown, and dull buffy brown, crissum unmarked; throat very narrowly streaked with fuscous; thighs more or less heavily spotted or barred with cinnamon brown and barred with dull cinnamon or drab; lining of wing pinkish buff, streaked or spotted with fuscous. Bill black or bluish black, plumbeous basally, cere and angle of mouth yellowish green or greenish yellow; iris sulphur yellow; legs and feet lemon yellow or straw yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Pale pinkish buff, paler below. *Natal:* White or cream white.

MEASUREMENTS: *Adult male:* Wing, 162.1–184.9 (average, 171.2) mm.; tail, 134.1–152.4 (140.7); bill (culmen from cere), 9.4–10.9 (10.2); height of bill at base, 9.1–10.9 (10.2); tarsus, 46.0–54.1 (49.8); middle toe without claw, 27.9–35.1 (30.7). *Adult female:* Wing, 180.1–210.1 (200.2); tail, 140.1–179.6 (165.9); bill, 10.4–14.0 (12.7); height of bill, 10.9–12.4 (11.7); tarsus, 45.0–58.4 (54.8); middle toe, 32.5–38.6 (36.3).

RANGE: N.w. Alaska, n.w. Mackenzie, n. Manitoba, and s. Labrador, south (excluding Queen Charlotte Islands and probably adjacent mainland coasts) to s. California, Texas, and South Carolina. Winters chiefly from s. British Columbia, Nebraska, and Nova Scotia through United States and Mexico to Costa Rica, casually to Panama; also Bahamas (a few) and Greater Antilles (perhaps).

TEXAS: *Breeding:* No skin, but one exact date of eggs collected: Wise Co., near Decatur (Apr. 30, 1888, J. A. Donald); for record of eggs obtained in Hidalgo Co. see species account. *Winter:* Taken north to Wilbarger, east to Cooke, south to Lee and Cameron, west to Kinney, Presidio (Sept. 16), and El Paso cos.

NESTING: *Nest:* In woodlands, groves, or in semiopen country; in tree, usually coniferous, at varying heights; bulky, rather

loosely constructed, somewhat shallow platform of large and small sticks and leaves; lined with small twigs, strips of bark, moss, grass, leaves, and occasionally feathers. *Eggs*: 3–8, usually 4–5; oval to short ovate or ovate, sometimes nearly spherical; smooth but not glossy; bluish white, grayish white, or greenish white; heavily blotched and spotted with various shades of brown, and with shell markings of dull lavender or lilac; average size, 37.1×30.5 mm.

COOPER'S HAWK, *Accipiter cooperii* (Bonaparte)

SPECIES ACCOUNT

See colorplate 4

Closely resembles the Sharp-shinned Hawk, but sex for sex is larger (anticipate overlap between small male Cooper's and large female Sharpshin); has a rounded tail (instead of square-tipped or notched). Tails of both species appear rounded when spread. Length, 17 in. (male), 19 (female); wingspan, $30\frac{1}{2}$ (male), $33\frac{3}{4}$ (female); weight, $9\frac{1}{4}$ oz. (male), $18\frac{1}{4}$ (female). Largest male recorded by Oberholser weighed 11.50 oz.; smallest female, 15.87.

RANGE: S. British Columbia, s. Manitoba, n. Michigan, and Nova Scotia, south to Baja California, Sonora, Sinaloa, Chihuahua, Nuevo León, Texas, Gulf states, and c. Florida. Winters chiefly from Washington, Colorado, Iowa, and s. Maine through United States and Mexico to Costa Rica.

TEXAS: (See map.) *Breeding:* Mar. to July (eggs, Apr. 1 to May 30; young in nest as late as June 23) from near sea level to about 5,000 ft. Uncommon to rare and highly irregular almost throughout, though very localized in Panhandle. Recent nesting records: Brooks Co., Falfurrias (pair nested, summer 1964, Dr. and Mrs. A. W. O'Neil); Culberson Co., Guadalupe Mts., McKittrick Canyon (pair nesting each year,

1960–1969, fide F. R. Gehlbach). *Winter:* Late Aug. to early May (extremes: Aug. 2, May 15). Fairly common to uncommon virtually throughout, though very scarce in sections without woodlands or brush.

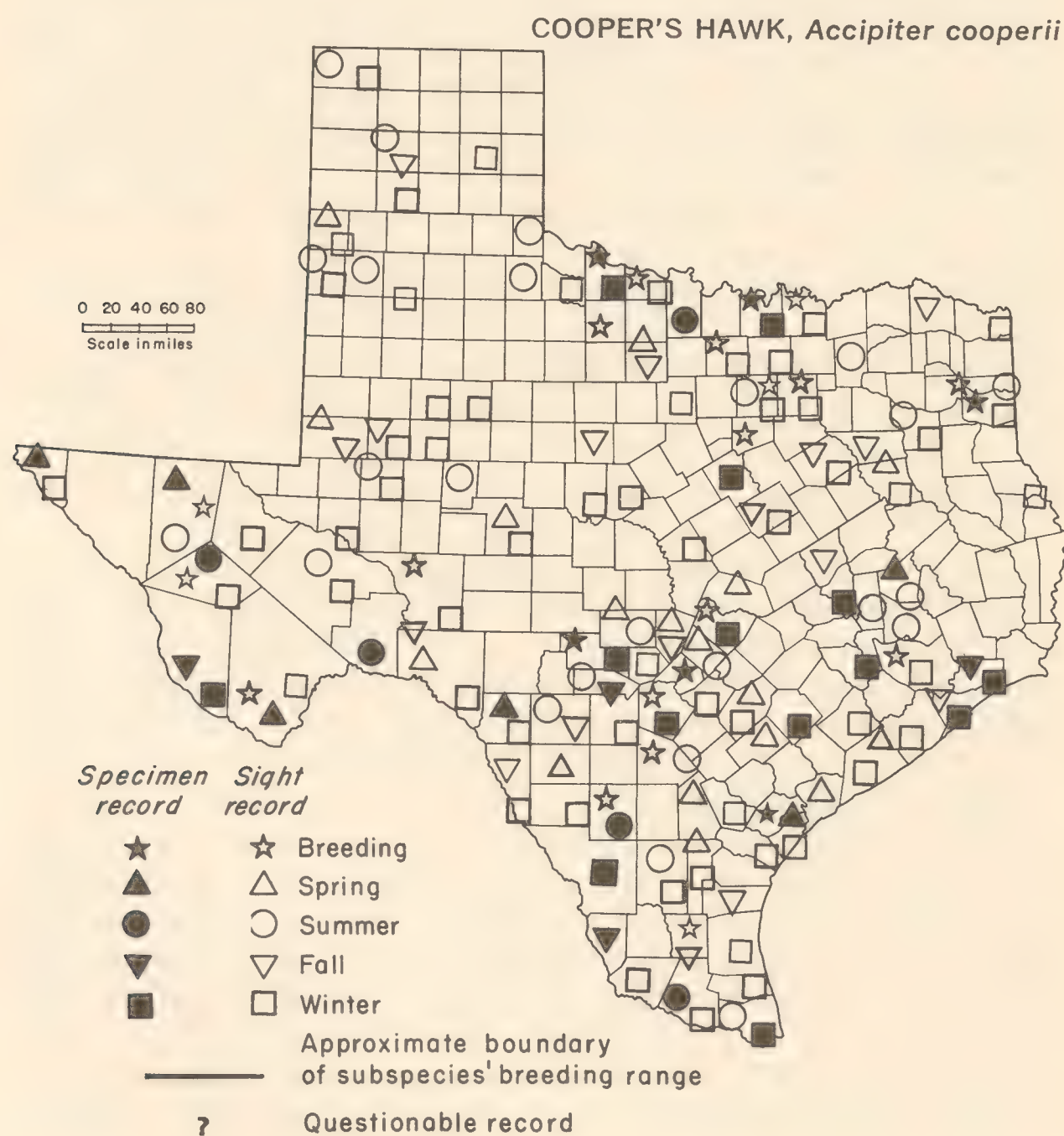
HAUNTS AND HABITS: *Accipiter cooperii* is a larger version of the Sharp-shinned Hawk. So incompatible are these similar thicket- and woodland-dwelling, bird-preying hawks, that although there is extensive overlap of their general ranges in Canada and the United States, each perforce occupies separate local hunting and nesting territories. The once common Cooper's Hawk still has a wide distribution in North America but is everywhere steadily declining—except perhaps in a few isolated spots, such as the Chiricahua Mountains of Arizona. Northern individuals of this species migrate south in fall, some traveling as far as Costa Rica and, in one instance, to Colombia. At this season they travel in small parties, often with Sharpshins.

About 75 percent of the Cooper's diet is birds, chiefly woodland, thicket, and brush species—quail, dove, woodpeckers, flickers, jays, Robin, Starling, warblers, others; some open-country birds, especially meadowlarks, are taken. Also a few small rodents, lizards, frogs, and large insects are hunted. This assortment of often fleeting, often elusive prey demands swift, dashing, and controlled flight, which *A. cooperii* exhibits to perfection. In pursuit of a victim, the Cooper's flaps vigorously, then sails briefly on its short wings, and maneuvers with its rudderlike tail as it darts swiftly and low amid trees and even dense shrubs. Higher in the air, when migrating or during nuptial displays, it flies in a similar flap-sail-flap fashion.

Predation on domestic pigeons and chickens is in most cases the work of accipiters, and the larger Cooper's surpasses the Sharpshin in this department. Seldom do the predominantly rodent- and insect-eating buteos harm such fowl. It also appears that individual Cooper's Hawks, rather than the species as a whole, develop a domestic bird habit. These few individuals are usually promptly hunted down, but their particular tendencies help sustain a general antipathy among farmers and ranchers for all hawks, which they usually lump together as "chicken hawks." The Cooper's, like the other accipiters, has a safety advantage in its perching preference and flying habit. It secludes itself in leafy coverage of a tree and when on the wing moves rapidly. Thus, it is a more difficult target than are buteos and eagles, innocent of chicken-yard crimes but nonetheless more vulnerable as they slowly soar for sustained periods and sit long intervals on telephone poles, bare limbs, and other exposed perches.

The alarm note of the Cooper's Hawk, uttered about the nest, is a loud, metallic *kek kek kek kek kek*, etc., lower pitched than the similar cry of the Sharpshin. A drawn-out whistled *swee-ew*, apparently sounded by the female, is another note of fright or anger.

CHANGES: In the days when real farmers and ranch-



ers, instead of soulless corporations, grew chickens, *Accipiter cooperii*, usually referred to amid bouts of profanity as "blue darter" or "big blue darter," was a bit of a terror to domestic fowl. An individual would dash like a blue streak into the barnyard, grab a small chicken, and be long gone before the farmer could get his gun.

Nowadays, exposed chicken pens, wild birds, thickets, brush patches, and woods—all more or less essential items to accipiters—are much scarcer than they were before 1940. Overpopulation and pollution have greatly accelerated along with habitat destruction. Bird-eating hawks have declined, but hard figures are extremely difficult to obtain. Accipiters, especially the Sharp-shinned and Cooper's, are so reclusive that they, unlike vultures, eagles, and buteos, cannot be meaningfully censused from a car or even very well on foot.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Pileum blackish mouse gray or blackish plumbeous, feathers of occiput with concealed white bases; back dark mouse gray; rest of upper parts deep mouse gray; feathers of whole upper surface with slightly darker shafts and obscurely darker edges; tail deep mouse gray to mouse gray with three broad bars of fuscous black or chaetura black, outer feathers hair brown, broadly tipped with white; primaries fuscous, becoming white on basal portion of inner webs, and barred with fuscous black; remainder of exposed surface of wing like back; sides of head dull russet with numerous narrow fuscous shaft streaks; lower parts white, chin and throat with narrow shaft streaks of fuscous, remainder of lower parts except unmarked crissum, heavily barred with russet or dull ochraceous tawny; lining of wing light buff or white with bars and spots of fuscous and russet. Terminal half of bill black, basal half of maxilla mineral gray, of mandible light medic blue; cere greenish yellow or biscay green; inside of mouth dull baryta yellow; iris orange-red, straw yellow, lemon yellow, or brown; legs and feet rich lemon yellow, apricot yellow, or greenish yellow; claws black. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male but larger; upper parts duller, more brownish; lower surface often less heavily marked. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second nuptial:* Acquired by wear from second winter. Similar to corresponding sex of nuptial adults, but plumage duller and somewhat more brownish. *Male and female, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *Male and female, first nuptial:* Acquired by wear from first winter, with which it is identical. Bill bluish black, lighter below; cere greenish yellow; iris yellow; legs and feet pale yellow; claws black. *Male and female, first winter (juvenal plumage of most authors):* Acquired by complete postjuvenal molt. Pileum and hindneck fuscous black, streaked with cinnamon, orange cinnamon, and tawny; remainder of upper parts fuscous, paler posteriorly and verging toward hair brown on rump; most of feathers with mostly concealed large white spots or broad white bars edged with tawny, cinnamon, and pale buff; several broad light bars on tail hair brown, dark bars fuscous black, and broad tip dull white; wing-quills fuscous, becoming white on inner webs toward base and barred with fuscous black; remainder of wings like back; lining of wing white or buffy white, spotted and streaked with fuscous; sides of head like pileum; upper breast and jugulum washed with cinnamon, and remainder of lower parts white or buffy white; crissum immaculate, rest of lower parts more or less streaked with fuscous; thighs streaked or spotted with fuscous. Bill plumbeous lavender gray or french

gray at base, dull black or bluish slate terminally; cere citron or olive yellow; iris greenish white to slate gray, pale straw yellow, or chrome yellow; legs and feet light greenish yellow, naples yellow, or lemon yellow; claws black or slate black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Entirely white. *Natal:* White; upper parts with faint creamy or yellowish tinge.

MEASUREMENTS: *Adult male:* Wing, 214.1–238.0 (average, 231.1) mm.; tail, 181.1–211.1 (198.9); bill (culmen from cere), 15.0–17.5 (16.3); height of bill at base, 15.5–17.0 (16.3); tarsus, 61.5–72.9 (64.3); middle toe without claw, 35.1–48.0 (40.4). *Adult female:* Wing, 247.1–278.1 (259.8); tail, 215.1–242.1 (220.7); bill, 17.5–21.1 (19.0); height of bill, 17.0–18.0 (17.8); tarsus, 66.0–74.9 (71.4); middle toe, 41.9–49.5 (46.3).

TEXAS: *Breeding:* Collected north to Wilbarger (eggs), east to Cooke (eggs) and Harrison (eggs), south to Refugio and Hidalgo, west to La Salle, Brewster, and Culberson cos. *Winter:* Taken north to Wilbarger and Cooke, east to Chambers, south to Cameron, west to Presidio and El Paso (Mar. 2) cos.

NESTING: *Nest:* In forests, groves, and fringes of timber along creek bottoms; in coniferous or deciduous tree, sometimes in nest of other hawk, crow, or squirrel; bulky, open-topped structure of sticks and twigs; lined with bark, moss, grass, leaves, and weed stalks. *Eggs:* 2–6, usually 3–4; rounded ovate, or ovate to rounded oval, sometimes nearly spherical; smooth, not glossy; bluish white or greenish white; sometimes unmarked, but often spotted obscurely with reddish brown, drab, or lilac; average size, 49.0 × 38.6 mm.

RED-TAILED HAWK, *Buteo jamaicensis* (Gmelin)

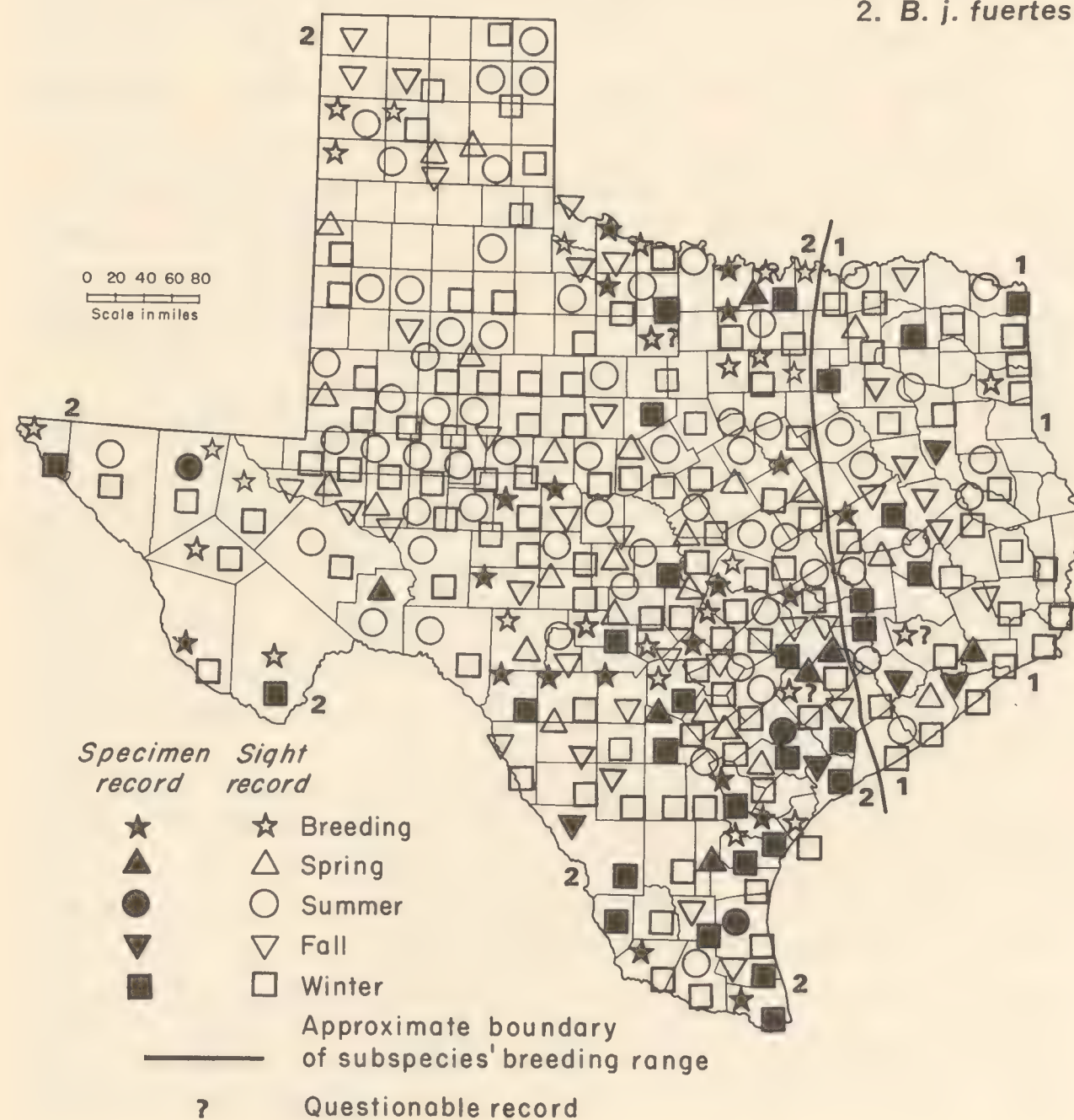
SPECIES ACCOUNT

See colorplate 5

A large soaring hawk, highly variable in plumage. *Adult (light phase):* dark brown above, variegated more or less with whitish and rufous; short blackish streak extends from gape; tail is rufous above—light cinnamon underneath—and may show blackish sub-terminal band and whitish tip; whitish under parts,

RED-TAILED HAWK, *Buteo jamaicensis*

1. *B. j. borealis*
2. *B. j. fuertesi*



often brown-streaked on sides of lower neck and across belly. Some racial variations: *kriderii* appears faded, has whitish tail (both surfaces); *fuertesi* lacks conspicuous markings on under parts; *calurus* is often very cinnamon below or frequently melanistic. *Dark phases*: blackish or dark reddish brown above; extensively mottled with same below; retain rufous (paler below) tail. *Immature (light phase)*: heavily whitish-mottled brownish above; tail (both surfaces) is gray-brown with numerous (7 to 10) narrow blackish bars; creamy white below, heavily streaked, spotted, and barred with brown, but usually with an unmarked white area on breast. Length, $21\frac{1}{2}$ in. (male), $22\frac{1}{2}$ (female); wingspan, $4\frac{1}{4}$ ft. (male), $4\frac{1}{2}$ (female); weight, $2\frac{1}{2}$ lbs. (male), 3 (female).

RANGE: C. Alaska, Manitoba, and Nova Scotia, south through United States and Mexico (chiefly mountains) to w. Panama; also Bahamas and Greater and n. Lesser Antilles. Migratory in colder portions of range, wintering chiefly from s. British Columbia, Nebraska, and s. Maine to Nicaragua.

TEXAS: (See map.) *Breeding*: Late Feb. to late June (eggs, Mar. 2 to May 25) from near sea level to about 5,000 ft. Fairly common to scarce almost throughout, though increasingly rare in some areas (south Texas brush country, portions of central and upper coasts, southern Panhandle). *Winter*: Common to uncommon virtually throughout.

HAUNTS AND HABITS: The graceful, high-soaring buteos, or buzzard hawks, comprise the largest subfamily of Accipitridae. The various members of this robust group, from Arctic to Tropics, inhabit high rugged mountains, forests, woody riverbottoms, or sparsely vegetated plains, prairies, rangelands, and deserts. In North America, the most common and widely distributed species is the Red-tailed Hawk. It ranges all the just-named habitats, although it is exceedingly rare in arctic regions and tropical lowlands. Redtails inhabiting northern areas move to better hunting grounds in winter. In transit, this ordinarily solitary hawk joins in small companies with its fellows; these parties, in turn, are seen along major flyways, sometimes in loose association with more migratory hawks, especially the Swainson's in the western United States and the Broadwing in eastern sections.

Even more than most other buteos, the Redtail is subject to wide plumage differences, depending on age and race. This picture is further complicated by the existence of color phases from light to dark within a single race, by the Redtail's similarity to the Harlan's Hawk, and by the resemblance of some immatures of *B. jamaicensis* to Rough-legged, Ferruginous, and Swainson's hawks.

A sharp-eyed hunter, the Redtail, like its allies, will stalk prey as it soars high (usually from 100 to 500 ft.) in the air or as it flaps and sails in harrier fashion—though rather more heavily—low to the ground. However, buteos generally prefer searching for prey from an exposed perch—bare limb of a tree, rocky ledge, telephone pole, or fence post. When something

is spotted, the hawk swoops down and, with extended talons, pins its catch to the ground. Although the Redtail's diet is largely rodents and insects, its highly beneficial eating habits continue unacknowledged by most farmers and ranchers, who persist in shooting, poisoning, and trapping *B. jamaicensis*, as well as destroying its nests. It appears, in fact, that no hawk species enjoys grace from this relentless persecution. Other food in the Redtail's diet, variable with locale, includes ground and tree squirrels, rabbits, snakes, lizards, frogs, crayfish, also carrion. If a bird is taken, it is ordinarily old, diseased, or crippled; a healthy individual is usually too quick for a Redtail.

The cry of the Red-tailed Hawk, given in flight or from a perch, is a nasal squeal, slurring downward: *keeer-rr*. This call is heard all year but is more frequent in months when pairs are maintaining nesting territories.

CHANGES: Remarkable for a raptor, the status and distribution of the relatively adaptable and flourishing Red-tailed Hawk have so far changed little. Now (1972), as in the past, it could almost be said that any large hawk in Texas, especially in winter, is a Redtail unless proved otherwise! However, nesting in the south Texas brush country from San Antonio to Brownsville has declined almost to vanishment in the last twenty five years.

DETAILED ACCOUNT: FOUR SUBSPECIES

EASTERN RED-TAILED HAWK, *Buteo jamaicensis borealis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Top of head and rump fuscous; remainder of upper parts fuscous black, head and neck streaked with tawny and cinnamon; tail dull russet to tawny, outer webs of rectrices cinnamon buff, paling to white at base, and with a narrow fuscous bar near end and a dull white tip; upper tail-coverts, except fuscous middle feathers, dull russet or tawny, more or less mixed or barred with buff or buffy white; primaries fuscous, inner webs becoming white at base, broadly barred with hair brown, and mottled on white basal portions with hair brown; inner secondaries hair brown, barred with white on most of inner webs and with fuscous on remainder of feathers; wing-coverts fuscous, more or less mottled with cinnamon, tawny, and light buff; lores dull white; rictal stripe fuscous; posterior sides of head and neck tawny, somewhat mixed and clouded with fuscous; middle of chin and upper throat dull white, streaked with fuscous; sides of throat dull cinnamon rufous; remainder of lower parts dull white or light cinnamon buff, streaked on sides of jugulum with dull cinnamon or cinnamon; lower breast and upper abdomen with zone of conspicuous spots, streaks, or imperfect bars of fuscous or russet; thighs pale cinnamon buff or buffy white, immaculate or with obscure markings of dull cinnamon or brownish; lining of wing white or buffy white with streaks, spots, or bars of tawny, hair brown, and cinnamon. Bill slate black or slate color, but base plumbeous or cinereous; cere pea green or olive yellow; inside of mouth cream color to olive buff; iris yellow or dark brown; legs and feet olive yellow or naples yellow; claws black. *Adults, nuptial (dark phase):* Similar to light phase, but upper parts darker, more blackish, usually more sooty (less brownish); lower parts more or less extensively blotched with sooty black; in this respect sometimes similar to Harlan's Hawk, *Buteo harlani*; distinguished from dark phase of *B. j. calurus* (see below), in that black is more sooty (less brownish). *Adults, winter:* Acquired by com-

plete postnuptial molt. Similar to nuptial adults in corresponding phase. *Second nuptial*: Acquired by wear from second winter. Similar to nuptial adults in corresponding phase, but upper tail-coverts barred with fuscous; tail marked with incipient fuscous bars, largely on basal portion of feathers, these bars irregular and usually not complete; tawny areas of tail often duller; breast much more heavily streaked. *Second winter*: Acquired by complete postnuptial molt. Similar to corresponding phase of second nuptial. *First nuptial (light phase)*: Acquired by wear from first winter, with which it is practically identical. Bill, cere, and feet similar to those of adults, but iris light gray or dull yellow. *First winter* (juvenal plumage of most authors) *light phase*: Acquired by complete postjuvenal molt. Similar to nuptial adults, but usually less rufescent; upper tail-coverts fuscous, barred with white; tail hair brown, with numerous (usually about 10) narrow bars of fuscous or fuscous black; lower parts white, throat and abdomen heavily streaked, the latter broadly, with fuscous and fuscous black, thighs with spots or bars of dull wood brown. Bill dark brown or black, but base lilac gray; cere olive buff or light yellow; iris brownish cream color, light gray, or dull yellow; legs and feet dull straw yellow or greenish yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by post-natal growth. Entirely white. *Natal*: Grayish white or buffy white.

MEASUREMENTS: *Adult male*: Wing, 337.1–396.0 (average, 369.8) mm.; tail, 197.1–240.0 (215.6); bill (culmen from cere), 23.6–28.4 (25.4); height of bill at base, 19.0–22.1 (20.3); tarsus, 78.0–90.9 (82.3); middle toe without claw, 39.4–47.0 (42.7). *Adult female*: Wing, 370.1–427.0 (388.9); tail, 214.6–254.0 (230.4); bill, 25.4–30.2 (26.7); height of bill, 21.6–23.9 (22.9); tarsus, 76.7–92.5 (84.3); middle toe, 41.1–55.6 (47.0).

RANGE: Manitoba to Nova Scotia, south to e. Texas and n. Florida. Winters chiefly from s. Minnesota and s. Maine to Jalisco, Michoacán, San Luis Potosí, U.S. Gulf coast, and s. Florida.

TEXAS: *Breeding*: No skin, but eggs collected in McLennan Co., Waco, 427 ft. (Apr. 10, 1899, J. M. Carroll) and Robertson Co., Wheelock, ca. 350 ft. (Mar. 25, 1861, F. Kellogg); also a nesting pair observed in Harrison Co., Marshall, 375 ft. (June 24, 1922, O. R. Harmon) considered to be of this subspecies. Scarce to rare. *Winter*: Taken north to Cooke, east to Bowie and Chambers (Mar. 7), southwest to Jim Wells (Mar. 15) and Zapata, west to Bexar and Llano cos. Fairly common.

NESTING: *Nest*: In forests, often heavy timber, on cliffs, occasionally in swamps; in tree, sometimes abandoned crow's nest used; large and bulky platform, often rather solidly constructed with well-marked depression for eggs; composed of sticks, leaves, grass, moss, and trash; lined with grass, weeds, leaves, moss, bark, twigs, and feathers. *Eggs*: 1–4, usually 2–3; elliptical ovate to ovate oval or short ovate; white, cream white, or bluish white; sometimes unmarked, but usually spotted and blotched with different shades of reddish and yellowish brown, lavender, and drab; average size, 59.9×47.5 mm.

KRIDER'S RED-TAILED HAWK, *Buteo jamaicensis kriderii* Hoopes

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. j. borealis*, but upper parts with more admixture of white and less of cinnamon buff or tawny; lower parts more purely white, markings fewer or nearly absent. Bill dull black or blackish plumbeous, but base of maxilla olive gray, base of mandible pearl gray; inside of mouth Naples yellow; cere pale olive yellow; iris golden brown, cinnamon, or pale straw yellow; legs and feet straw yellow or greenish yellow; claws black or dark brown.

MEASUREMENTS: *Adult male*: Wing, 352.1–400.0 (average, 379.5) mm.; tail, 204.0–231.9 (221.2); bill (culmen from cere), 23.1–27.4 (25.7); height of bill at base, 20.6–21.6 (21.1); tarsus, 81.0–90.4 (84.8); middle toe without claw, 39.6–45.5 (42.4). *Adult female*: Wing, 392.9–432.1 (413.5); tail, 218.9–247.9 (237.5); bill, 23.9–29.9 (26.7); height of bill, 21.1–22.6 (22.1); tarsus, 81.4–94.0 (87.6); middle toe, 39.9–49.5 (46.5).

RANGE: S. Alberta to w. Ontario, south to Wyoming, e. Colorado (probably), Iowa, and Minnesota. Winters from North Da-

kota and Minnesota to New Mexico, Durango, Zacatecas, Texas, Louisiana, and Florida.

TEXAS: *Winter*: Taken north to Cooke, east to Harris (Oct. 15), south to Cameron, west to Atascosa and Eastland cos. Uncommon and local.

FUERTES' RED-TAILED HAWK, *Buteo jamaicensis fuertesi* Sutton and Van Tyne

DESCRIPTION: *Adults, nuptial plumage*: Similar to *B. j. borealis*, but dark streaks on lower breast and flanks narrower and smaller; tail lighter above; subterminal tail-band narrower; rufous area of lower foreneck and upper breast much reduced. Bill basally plumbeous, but terminally fuscous; cere pale greenish yellow; iris olive brown or light brown; legs and feet very light lemon yellow; claws fuscous. *First winter* (juvenal plumage of most authors): Like first winter of *B. j. borealis* but somewhat lighter, more buffy above, particularly tail; less heavily marked below, especially on breast and sides. Similar to *B. j. kriderii* but much darker, less extensively white above. Similar to *B. j. calurus* (see below), but lower parts paler, dark streaks on breast and flanks much narrower; thighs unmarked or only very slightly barred with buff; nape and upper back with less rufous. Bill plumbeous at base, fuscous on terminal portion; cere greenish plumbeous; iris brownish cream color; legs and feet straw yellow; claws black.

MEASUREMENTS: *Adult male*: Wing, 385.0–402.1 (average, 393.2) mm.; tail, 205.0–224.1 (212.1); bill (culmen from cere), 25.4–26.9 (26.2); height of bill at base, 21.1–23.1 (21.4); tarsus, 78.0–90.9 (87.9); middle toe without claw, 43.4–47.0 (46.3). *Adult female*: Wing, 424.9–436.1 (427.0); tail, 220.0–228.1 (224.1); bill, 25.9–28.4 (27.7); height of bill, 23.9–24.9 (24.4); tarsus, 90.9–94.0 (93.2); middle toe, 48.0–52.1 (49.8).

RANGE: N. central Texas, south to Chihuahua, Coahuila, and Nuevo León; probably s. California, s.e. Arizona, n. New Mexico, and Oklahoma.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to about 5,000 ft. Collected north to Wilbarger (eggs), east to Cooke, south to Refugio and Cameron, west to Brewster, Presidio, Culberson, and El Paso cos. Fairly common.

NESTING: *Nest*: Often in strips of timber along streams or in trees in brush; otherwise similar to that of *B. j. borealis*. *Eggs*: Probably 1–4, usually 2–3; broadly oval; white with spots and blotches of chocolate brown, pale purplish gray, and pale rufous, chiefly near smaller end; average size, 59.4×45.7 mm.

WESTERN RED-TAILED HAWK, *Buteo jamaicensis calurus* Cassin

DESCRIPTION: *Adults, nuptial plumage (light—normal—phase)*: Similar to *B. j. borealis*, but darker above with more tawny and cinnamon buff above and below, particularly on pileum, hind-neck, thighs, breast, and rump; thighs much barred with cinnamon or pale tawny. *Adults, nuptial (dark phase)*: Similar to light phase, but upper parts more uniform, with less tawny admixture, particularly on head, neck, and rump; lower parts very much darker, almost uniform fuscous to fuscous black or clove brown; breast and jugulum sometimes rather rufescent cinnamon brown. Bill dull black terminally, light bluish plumbeous or gray at base; cere and corner of mouth Naples yellow, olive yellow, or greenish yellow; iris dark hazel, light hazel, russet, light yellow, or partly brown and partly yellow; legs and feet Naples yellow; claws black. *Adults, nuptial (tawny phase)*: Upper parts like normal phase, but lower surface almost uniform tawny or russet, except chin clove brown or fuscous and abdomen heavily barred or streaked with fuscous or fuscous black. *First winter* (juvenal plumage of most authors) *light phase*: Similar to first winter *B. j. borealis* but darker and with more cinnamon and buff above and below. Bill blackish terminally, light bluish gray at base; cere pale green; iris pale straw color, pale brown, or light gray; feet pale yellow; claws black. *First winter (dark phase)*: Similar to adults in dark phase, but chin often mixed with white; tail barred as in light phase.

MEASUREMENTS: *Adult male*: Wing, 358.1–404.1 (average, 387.1) mm.; tail, 207.0–237.0 (223.3); bill (culmen from cere), 23.6–28.4 (25.1); height of bill at base, 19.0–22.4 (20.3); tarsus, 80.7–93.0 (85.3); middle toe without claw, 39.6–48.5 (43.7). *Adult female*: Wing, 386.1–428.0 (411.2); tail, 220.0–248.9 (236.7); bill, 24.6–30.5 (27.2); height of bill, 20.6–23.1 (22.1); tarsus, 82.0–96.0 (88.1); middle toe, 41.4–54.6 (47.3).

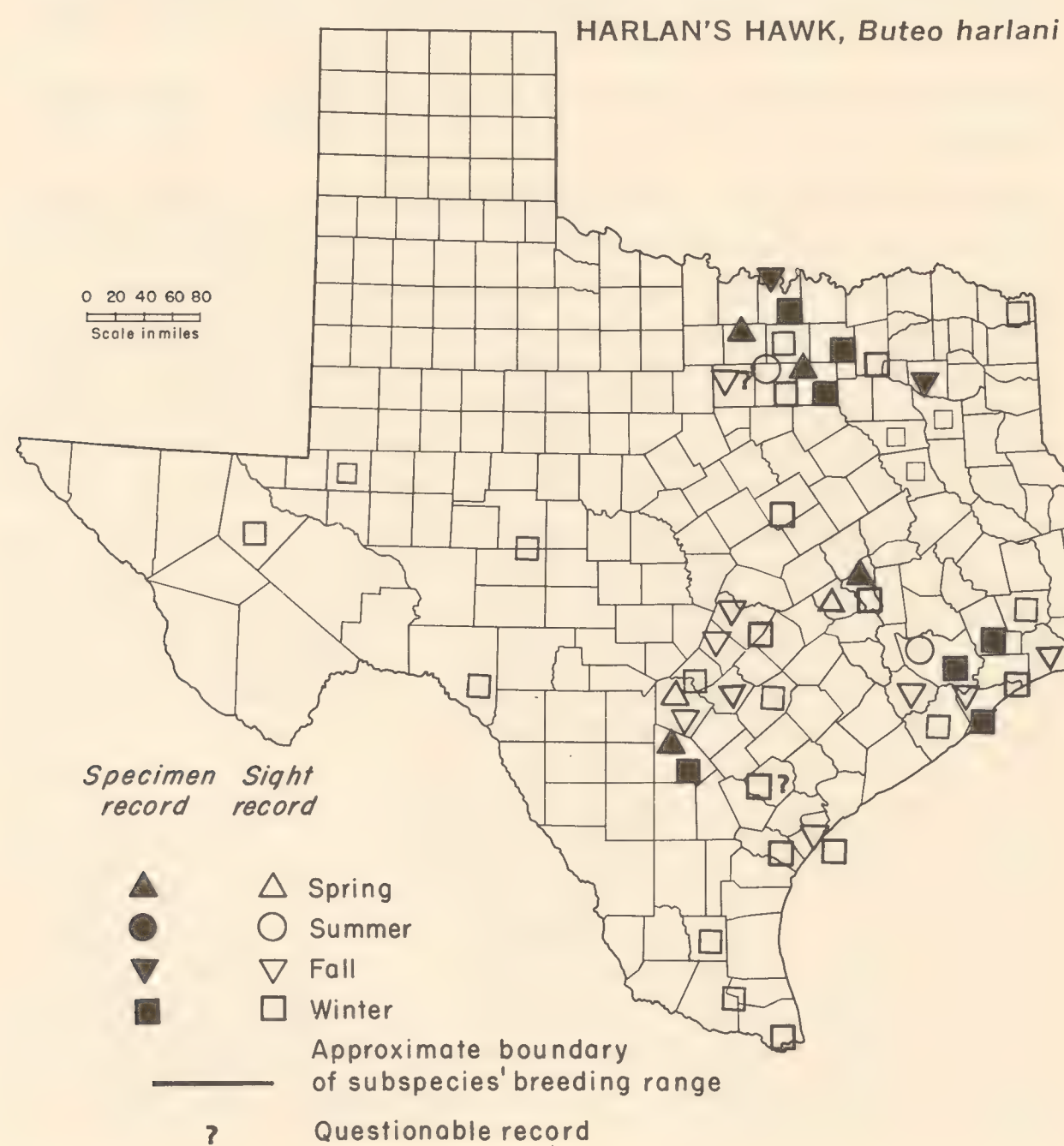
RANGE: C. Alaska to w. Mackenzie, south (excluding birds from s.e. coastal Alaska, Queen Charlotte Islands, and Vancouver Island) to California and n. New Mexico. Winters chiefly from s.w. British Columbia, Wyoming, and s. Minnesota through w. United States and w. mainland Mexico to Nicaragua.

TEXAS: *Winter*: Taken north to Cooke, east to Leon and Harris (Nov. 24), south to Cameron, west to Brewster and El Paso cos. Uncommon.

HARLAN'S HAWK, *Buteo harlani* (Audubon)

SPECIES ACCOUNT

Considered a race of the Red-tailed Hawk by many authors (L. Brown, D. Amadon, et al.); name is then *Buteo jamaicensis harlani*. Enormous variation between color phases, but all adults should reveal the characteristic grayish or whitish tail with extensive blackish or brownish marbling, mottling, or flecking that blends into vague but broad dark subterminal band. *Dark phase* (preponderant): in fresh plumage, grayish black (not brownish black as in melanistic Redtails). Feathers of body and wing-linings are white basally (instead of gray as in Western Redtail); these white feather bases sometimes show partially in the field, imparting to bird a spotted or blotched appearance, especially on breast. *Light phase*: more or less blackish above; variously blackish-streaked white below; tail as in dark phase but paler. *Immature (all phases)*: has numerous blackish bars on brown tail. Length, 21 in. (male), 22¾ (female); wingspan, 4 ft.



(male), 4¼ (female); weight, 2¼ lbs. (male), 3 (female).

RANGE: Yukon Valley and Mt. Logan region of Alaska, south to n. British Columbia (east of coastal mountains), Alberta (Red Deer area), and n. North Dakota. Winters chiefly from Kansas and s. Missouri to Texas and Louisiana.

TEXAS: (See map.) *Winter*: Mid-Oct. to mid-Mar. (extremes: Aug. 23, May 2). Locally uncommon (north central portion) to rare over eastern half; casual on Edwards Plateau (Tom Green Co., San Angelo, Dec. 23, 1970, M. E. Isleib, et al.; Schleicher Co., Eldorado, Dec. 26, 1967, fide Frances Williams), and in Trans-Pecos (Reeves Co., Balmorhea Lake, Jan. 1, 1968, and Dec. 26, 1970, Isleib, et al.; Ector Co., fide Anne LeSassier). No specimen records west of 99th meridian.

HAUNTS AND HABITS: Ever since 1831 when that flamboyant French-American woodsman, John James Audubon, named *Buteo harlani* for his friend Dr. Richard Harlan, the bird has been controversial. Is it or is it not a species apart from the Red-tailed Hawk? Over the years much ink and paper have been used in attempts to show exactly how many reddish freckles a Harlan's can have on its tail without being a Redtail.

Habitat and behavior of Harlan's Hawk seem to fit the Redtail mold with perhaps three minor exceptions. In Texas, *B. harlani* seems a bit more bound to deciduous woodlands than is *B. jamaicensis*, which, at least in its western race *calurus*, appears to be rather indifferent to trees. Harlan's is said to be slightly swifter on the wing and to catch more birds, but these tendencies are by no means verified. Like its very close relative, *B. harlani* appears so far to be holding its numbers well in an increasingly cleared and poisoned world. As recently as the Christmas season of 1970, 15 Texas Audubon Bird Counts turned up a total of 29 Harlan's Hawks.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (black phase)*: Acquired by wear from winter plumage. Upper and lower parts almost uniform fuscous black, anteriorly both above and below more grayish (less brownish) than in Eastern Red-tailed Hawk, *Buteo jamaicensis borealis*, and Western Red-tailed Hawk, *B. j. calurus*; tail, in large part, confusedly mottled and clouded with fuscous black, tawny, russet, hair brown, and on inner webs of feathers with dull white; under wing-coverts fuscous black, much spotted with white. Bill dark brown; iris dark brown or yellow; cere, corner of mouth, tarsus, and toes greenish yellow; claws black. *Adults, nuptial (light phase)*: Similar to *B. j. borealis* or to Krider's Red-tailed Hawk, *B. j. kriderii*; plumage below white, with chaetura black markings on only chin and throat, streaks or spots, if any, of same color on abdomen; tail, in part, white and mottled as is tail in black phase. Bill bluish black; cere yellow; iris yellow; legs and feet dull yellow; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Like corresponding phase of nuptial adults. *First nuptial*: Acquired by wear from first winter, with which, in corresponding phase it is identical. Bill blue-black; iris coffee brown; legs and feet dull yellow. *First winter* (juvenile plumage of most authors) *black phase*: Acquired by complete postjuvenile molt. Similar to adults in black phase, but tail barred numerously with fuscous and hair brown. Bill bluish black; cere greenish blue; iris dull light straw

yellow; legs and feet pale olive green; claws black. *First winter (light phase)*: Similar to adults in light phase, but tail barred numerously with fuscous and hair brown.

MEASUREMENTS: *Adult male*: Wing, 365.0–390.1 (average, 380.7) mm.; tail, 202.9–224.1 (212.3); bill (culmen from cere), 21.6–25.9 (24.1); height of bill at base, (21.6); tarsus, 66.0–95.0 (80.7); middle toe without claw, 39.1–43.9 (40.9). *Adult female*: Wing, 390.1–430.0 (409.2); tail, 207.5–238.0 (226.3); bill, 24.4–27.9 (26.2); height of bill, (22.6); tarsus, 73.9–100.1 (86.9); middle toe, 42.9–48.5 (44.7).

TEXAS: *Winter*: Taken north to Wise (Mar. 14) and Cooke, east to Wood (Oct. 27) and Liberty, south to Galveston, west to Atascosa and Bexar (1860) cos.

RED-SHOULDERED HAWK, *Buteo lineatus* (Gmelin)

SPECIES ACCOUNT

A medium-sized buzzard hawk. *Adult*: rufous-streaked dark brown head and back; rufous shoulders; checkered black and white on dorsal wing surface; narrow white bands (3 usually visible) alternate with broad black bands on white-tipped tail (similar bands on Broad-winged Hawk's tail are of equal width); rufous under parts, barred with pinkish on breast, sides, and thighs. In flight, rufous body and wing-linings contrast with checkered flight feathers, also translucent white patch at base of primaries often visible. *Immature*: lacks conspicuous shoulder-patch and white checkering on wings; has narrowly and numerous grayish-barred blackish tail; brownish-streaked whitish under parts. Length, 18½ in. (male), 19¾ (female); wingspan, 3¼ ft. (male), 3½ (female); weight (*B. l. lineatus*), 1¼ lbs. (male), 1½ (female).

RANGE: Extreme s. Oregon and California to n.e. Baja California; and from e. Nebraska and s. Quebec,

south to Zacatecas, State of México, Veracruz, U.S. Gulf states, and Florida. Withdraws in winter from far northern portion of range.

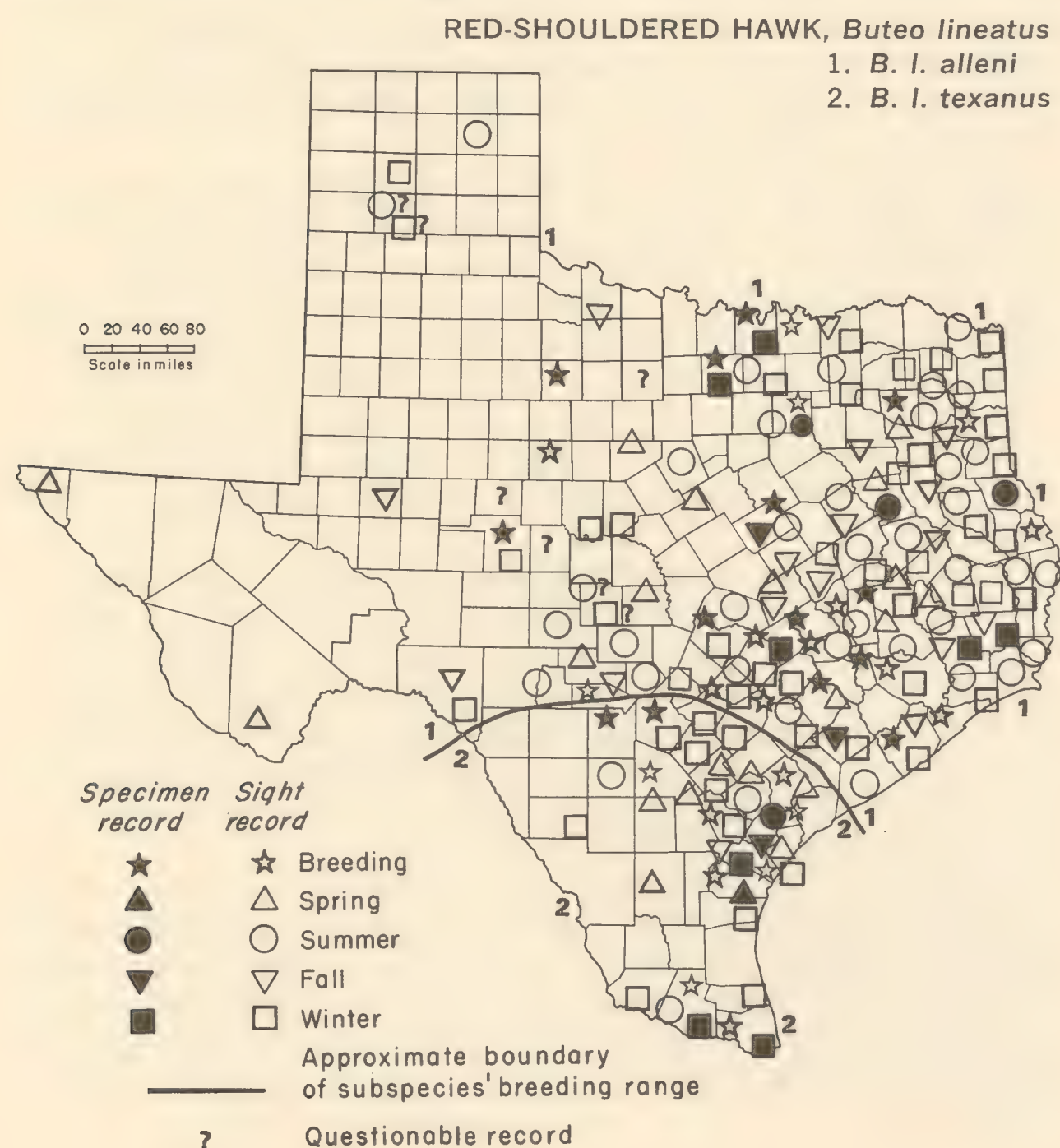
TEXAS: (See map.) *Resident*: Breeds, mid-Feb. to late June (eggs, Feb. 28 to early June) from near sea level to about 1,800 ft. Locally fairly common to uncommon over eastern half; at least formerly, west to Haskell, Taylor, and Tom Green cos. Nonbreeders occasional to Amarillo, Midland, and Del Rio; casual west of Pecos River (Brewster Co., Big Bend Nat. Park, Apr. 2, and 7, 1967, R. H. Wauer; El Paso Co., Socorro, Mar. 13, 1970, Steven West). Though decreasing, 7 nests found in one area as late as 1968 (San Patricio Co., Welder Wildlife Refuge, summer 1968, D. W. Woodard); nested successfully near Corpus Christi in 1970 (G. W. Blacklock).

HAUNTS AND HABITS: In eastern North America, the Red-shouldered Hawk is a daytime hunter in swamps, wet woods, and riverbottom timber. This same habitat is used nocturnally by the Barred Owl. Where *Buteo lineatus* range overlaps with the Red-tailed Hawk, as in the eastern half of Texas, the present species leaves the open country and higher, drier land to its somewhat larger, huskier relative, as well as to the Great Horned Owl. Between the 99th and 100th meridians, the Redshoulder meets its westernmost Texas breeding boundary as rivers and streams become more sparsely timbered; however, west of the southwestern U.S. deserts on the fairly humid and wooded Pacific slope of California, it reappears as the race *B. l. elegans*. Ordinarily, the Redshoulder is not gregarious, but northern individuals which drop south in winter often gather in small companies.

Soaring Red-shouldered Hawks are most frequently observed during the early part of the breeding season when pairs circle in the sky—often loudly *kee-yaring*. These powerful and sustained glides, in typical buteo fashion, often conclude with a swift dive to earth. When hunting, the Redshoulder is usually content to sit on a perch, sometimes for long periods, in wait for meadow or white-footed mice, other rodents, frogs, snakes, or insects; occasionally it takes a small bird. At other times it glides at treetop level or flies low over a marsh in search of prey.

Buteo lineatus is very vocal in spring and to some extent throughout the year. The loud, screaming *kee-yar* or *kee-you* (last syllable dropping in pitch) is sounded in flight or from a perch in series of twos or fours, at times even more. The Blue Jay is said to imitate this cry. However, the Brown Jay, *Psilorhinus morio*, of eastern Mexico sounds even more like a Red-shouldered Hawk; for many years this hawk's call along the lower Rio Grande has jumped the blood pressure of many a birder seeking to add the Brown Jay to the U.S. list. Similarity in calls of the Blue and Brown jays and Red-shouldered Hawk is more likely due to coincidence than to imitation.

CHANGES: Typical of most birds of prey, the Red-shouldered Hawk is losing its fight for survival. Analysis of nearly 10,000 Audubon Christmas Bird Counts



for the years 1950 through 1969 indicate that *Buteo lineatus* is decreasing everywhere except in California (population apparently stable) and in West Virginia (22 percent increase). Extreme decline of 95 percent has occurred in Rhode Island. Texas has shown an approximate average decrease of 54 percent. (For more details see W. H. Brown, 1971, *American Birds* 25: 813-817.) In Ontario from 1970 onward, Red-shouldered Hawk eggs were found to be breaking in the nest; the cause appeared to be a combination of agricultural chlorinated hydrocarbons and industrial mercuric chloride (*ibid.*, p. 821).

In Texas, at least into the early 1970's, alteration of Red-shoulder habitat would seem to be a more decimating factor than chemicals. Before building anything, even if only a creekside shack, Texans clear out underbrush and trees. The opening up of the landscape encourages the Red-tailed Hawk to take over the previously heavily timbered *Buteo lineatus* habitat; at the same time, the Great Horned Owl tends to displace the Barred Owl—and even to eat both young and old Red-shouldered Hawks.

Since 1950, deciduous trees that have not been removed to create "improved" pastures for livestock or to make room for pine tree farms are nowadays mostly drowned by reservoirs. Especially in the 1960's, there was a frenzied orgy of dam building in the wooded eastern portion of Texas, heartland of the Red-shouldered Hawk. Artificial lakes in east Texas are too numerous to list here, but three especially large ones were completed in 1969: Lake Livingston on the Trinity River, Sam Rayburn Reservoir on the Angelina, and Toledo Bend on the Sabine. Combined, these new lakes flooded over 600,000 acres of wooded bottomland. This massive inundation, added to the many other drownings, leaves little adequate habitat for Red-shouldered Hawks.

DETAILED ACCOUNT: THREE SUBSPECIES

NORTHERN RED-SHOULDERED HAWK, *Buteo lineatus lineatus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper parts fuscous to fuscous black, conspicuously streaked with tawny, cinnamon, and light buff; tail fuscous black, with several (about 6) rather narrow bars of dull white, and a broad white tip; upper tail-coverts fuscous and hair brown, broadly barred and tipped with white; wing-quills fuscous or fuscous black, barred with hair brown which on outer webs and inner webs of secondaries becomes white near edges of feathers, with more or less admixture of cinnamon and cinnamon buff; anterior lesser wing-coverts chestnut, more or less with broad shaft streaks of fuscous; remaining wing-coverts like back; sides of head pale dull buff much streaked with fuscous, including more or less well defined broad fuscous rictal streak; chin dull white or buffy white streaked with fuscous; remainder of lower parts dull cinnamon buff to dull pale cinnamon buff, anteriorly changing to light russet, between russet and ochraceous tawny; breast, sides, and thighs much barred and mottled with same color; crissum immaculate; lining of wing cinnamon buff, with tawny and fuscous markings. Bill slate black, plumbeous, or blackish slate, but most of mandible, except tip, cinereous, sometimes base of maxilla pale olive gray; cere, edge of eyelids, and inside of mouth light cadmium yellow, chrome yellow, deep

chrome, or dark yellowish green, orbital ridge dull green; iris mars brown, raw umber, or broccoli brown; legs and feet chrome yellow, dull cadmium, or dark yellowish green, feet usually rather darker; claws slate color or black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to nuptial adults, but upper parts less rufescent and with less chestnut on bend of wing; tail olive brown to fuscous, with narrow and more numerous bars of drab, hair brown, tawny, and orange cinnamon; lower parts white or buffy white, with numerous broad light cinnamon or tawny streaks and spots, particularly on breast and abdomen. Bill slate black, black, or dull dark brown, but base and most of mandible cinereous or plumbeous; cere greenish yellow, pale lemon yellow, or dull sulphur yellow; iris cream color, white, broccoli brown, sepia, or drab gray; legs and feet dull greenish yellow, pale straw yellow, pale chrome yellow, or very pale yellow, nearly white; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Upper parts grayish white; lower parts pure white. *Natal* (this plumage of this race not seen in Texas): Upper parts yellowish white, somewhat tinged on wings and back with vinaceous buff; lower parts white.

MEASUREMENTS: *Adult male:* Wing, 309.1-345.9 (average 321.1) mm.; tail, 193.0-228.1 (207.0); bill (culmen from cere), 19.3-23.6 (21.9); height of bill at base, 17.0-19.6 (18.0); tarsus, 74.9-83.6 (78.7); middle toe without claw, 33.3-40.4 (36.3). *Adult female:* Wing, 315.0-353.1 (339.3); tail, 206.7-236.7 (219.7); bill, 20.9-24.9 (23.4); height of bill, 17.5-20.1 (18.3); tarsus, 74.7-87.1 (80.2); middle toe, 34.8-41.7 (38.9).

RANGE: E. Nebraska to Minnesota and s. Quebec, south to s. Kansas and North Carolina. Winters chiefly from e. Kansas and c. New York to Nuevo León and Texas; rarely through Gulf states to Florida.

TEXAS: *Winter:* Two specimens: Cooke Co., Gainesville (Sept. 19, 1877, G. H. Ragsdale); Kendall Co., Boerne (date unknown, T. H. Faile).

FLORIDA RED-SHOULDERED HAWK, *Buteo lineatus alleni* Ridgway

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. l. lineatus* but smaller; paler above and particularly below; usually more grayish. *First winter* (juvenal plumage of most authors): Similar to first winter *B. l. lineatus* but smaller and darker; lower parts more heavily marked with dark brown. *Natal:* Probably similar to *B. l. lineatus*.

MEASUREMENTS: *Adult male:* Wing, 280.9-306.6 (average, 300.8) mm.; tail, 177.5-206.5 (188.2); bill (culmen from cere), 18.0-22.6 (21.1); height of bill at base, 17.0-20.1 (18.3); tarsus, 70.1-81.5 (77.0); middle toe without claw, 33.3-39.9 (36.1). *Adult female:* Wing, 301.0-340.1 (320.3); tail, 188.5-217.4 (199.9); bill, 22.6-25.4 (23.4); height of bill, 18.0-20.1 (18.8); tarsus, 77.0-83.1 (79.7); middle toe, 34.8-41.4 (38.4).

RANGE: E. Oklahoma to South Carolina, south to s.e. Texas, Gulf states, and Florida (excluding extreme southern tip and Keys).

TEXAS: *Resident:* Altitudinal breeding range, near sea level to about 1,800 ft. Collected north to Cooke, east to Wood (eggs) and Shelby, south to Brazoria, west to Travis (eggs) and McLennan cos.; farther west, at least formerly, to Bexar (eggs), Tom Green (eggs), and Haskell (eggs) cos. Locally fairly common. *Winter:* Two specimens outside breeding range: San Patricio Co., near Sinton (Dec. 19, 1959, C. Cottam); Nueces Co., Nueces River (Mar. 16, 1895, D. B. Burrows).

NESTING: *Nest:* In wooded bottomlands or swamps; in tree; composed of sticks, weed stalks, and moss; bowl lined with bark, moss, grass, pine needles, and feathers. *Eggs:* 2-3, usually 2; oval to ovate; white, bluish white, or grayish white; sometimes unmarked, but in most instances heavily blotched or spotted with dark brown, reddish brown, and lilac; average size, 50.8 × 42.4 mm.

TEXAS RED-SHOULDERED HAWK, *Buteo lineatus texanus*
Bishop

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. l. lineatus* but smaller, more extensively tawny below and, to a lesser extent, on upper surface. Similar to *B. l. alleni* but larger, darker, and more deeply rufescent, particularly on lower parts. *First winter* (juvenile plumage of most authors): Similar to first winter *B. l. lineatus*, but markings on under parts larger and more in the form of bars. Similar to first winter *B. l. alleni*, but somewhat less heavily marked on under parts; plumage also lighter above. *Natal:* Probably similar to *B. l. lineatus*.

MEASUREMENTS: *Adult male:* Wing, 302.0–322.1 (average, 310.6) mm.; tail, 181.1–205.0 (189.7); bill (culmen from cere), 21.1–22.6 (21.9); height of bill at base, (18.0); tarsus, 74.9–85.1 (78.0); middle toe without claw, 34.0–37.3 (35.6). *Adult female:* Wing, 325.1–350.0 (336.0); tail, 208.0–220.0 (214.1); bill, 22.1–23.9 (23.1); tarsus, 79.5–96.0 (85.1); middle toe, 35.1–41.9 (39.1).

RANGE: S. Texas, south to Zacatecas, State of México, and Veracruz.

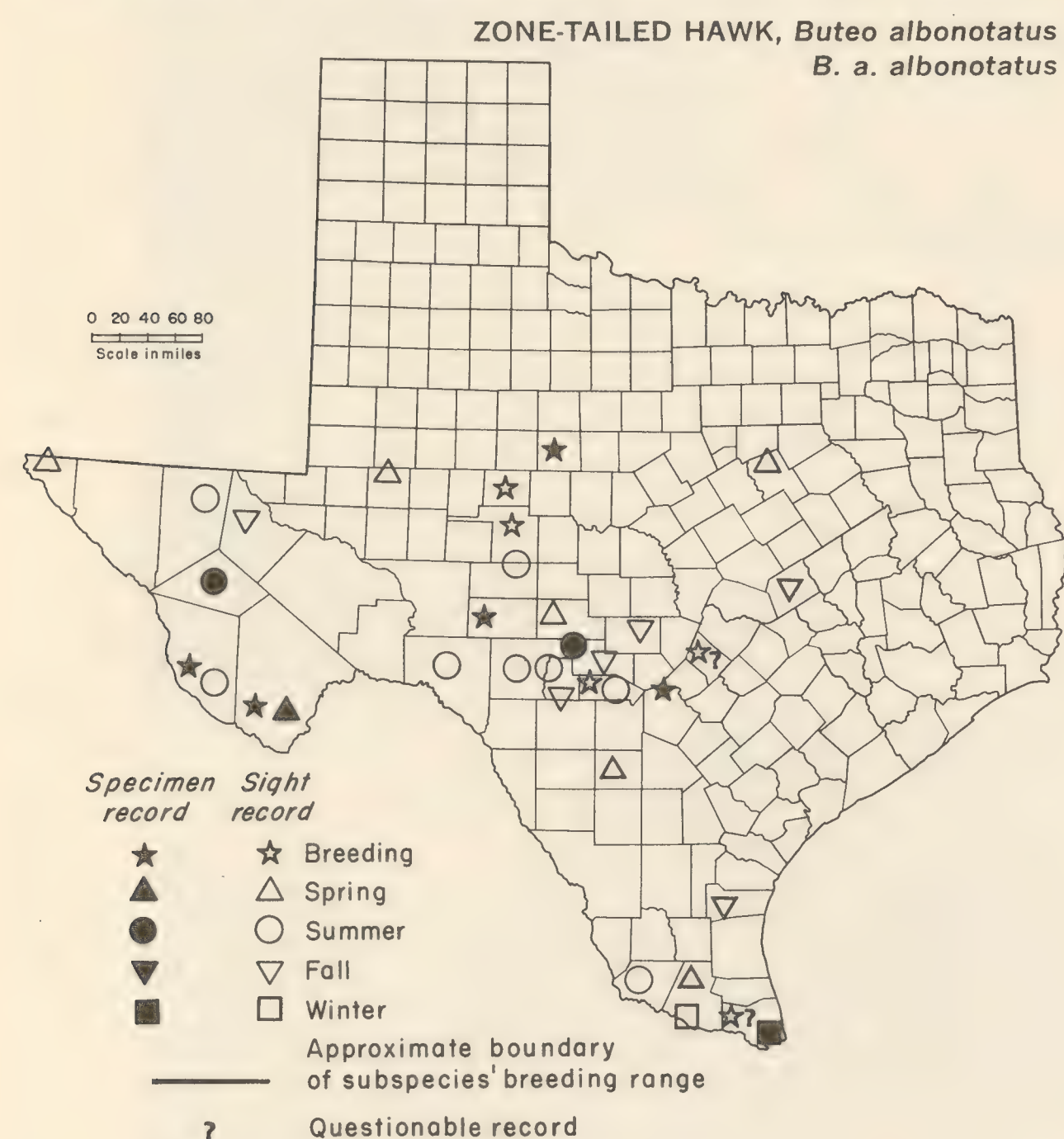
TEXAS: *Resident:* Altitudinal breeding range, near sea level to 900 ft. Collected northwest to Medina (eggs) and Bexar, east to Refugio, south to Cameron and Hidalgo cos. Locally fairly common.

NESTING: Similar to that of *B. l. alleni*.

ZONE-TAILED HAWK, *Buteo albonotatus* Kaup

SPECIES ACCOUNT

Adult: a streamlined black buteo with long wings and tail. Most likely to be mistaken for a Turkey Vulture (in flight, shows similar dihedral and underwing pattern—i.e., black linings, light grayish flight feathers), but distinguished by hawk head and a medial tail-band—white underneath, gray (whitish if tail is spread wide) on top; several narrower tail-bands seldom show much, if any, in the field. (The similar Black Hawk is chunkier; has very broad, blackish—



not two-toned—wings with a touch of white at base of primaries; short tail crossed in the middle by single conspicuous band, white on both surfaces.) *Immature:* dark sooty brown, more or less whitish-speckled below; underside of tail whitish with several vague narrow blackish bars and black tip; underwing as in adult. Length, 19 in. (male), 21¼ (female); wingspan, 4 ft. (male), 4½ (female); weight, 2¼ lbs. (female).

RANGE: Uncommon and local in hills and mountains of n. Baja California, c. Arizona, s. New Mexico, and s.w. Texas, south through mainland Mexico (mainly pine-oak highlands) to Panama (breeding status in many areas of Central America uncertain); and in n. South America to Peru, Bolivia, Paraguay, and Brazil. Seldom encountered north of Mexico in winter.

TEXAS: (See map.) *Breeding:* Mar. to July—present in breeding range as late as Oct. 2 (eggs, Mar. 29 to June 2) from perhaps near sea level—at least formerly—to about 7,500 ft. Uncommon in Big Bend (confirmed breedings in Presidio and Brewster cos., nesting probable in Jeff Davis Co.); scarce to rare and highly irregular elsewhere in Trans-Pecos and on western Edwards Plateau east to long. 100° W., one record at 99°33' W., formerly to about 98°10' W. Recent breeding in Trans-Pecos (Big Bend Nat. Park, 2 nests found and another suspected, summer 1969, R. H. Wauer) and in Edwards Plateau area (north of San Angelo near Coke-Tom Green county line, pair nested, late May–Aug., 1953, but young never fledged, L. O. Thompson, J. E. Galley, E. B. Kincaid, Jr., C. H. McNeese, F. G. Watson; and Bandera Co., Sabinal Canyon, pair and nest with 2 young found, June 13, 1964, Mr. and Mrs. G. W. Bickler, Velma Geiselbrecht; set of eggs taken at Sabinal Canyon, 1965, L. R. Wolfe). Formerly bred north and east to southern Taylor Co. (eggs taken, Mar. 29, 1894, H. G. Sayles) and Comal Co. (eggs taken at Cranes Mill, May 2, 1888, G. B. Benners, and along Guadalupe River, May 17, 1878, W. H. Werner); may have bred in Cameron Co. (noted as present and breeding in summer, ca. 1909, A. P. Smith). Recent summer sighting: Starr Co., Falcon Dam (July 2, 1971, Richard Webster). *Migration:* Late Mar. to late Apr.; early Sept. to late Oct. (extremes: Mar. 18, May 14; Sept. 2, Oct. 26). Rare in south Texas from breeding range south to Kleberg and Cameron cos.; casual in Hill Co. (Anne LeSassier). *Winter:* Nov. to Feb. (extremes: Nov. 9, Feb. 10). Very rare and irregular in Rio Grande delta; last known specimen, Cameron Co., near Brownsville (Feb. 10, 1912, A. P. Smith); accidental in Brewster Co. (Nov. 25, 1971, Mary and Richard Shannon), and Milam Co. (Nov. 15, 1970, T. B. Feltner).

HAUNTS AND HABITS: Rough, deep, rocky canyons and streamsides in semiarid mesa, hill, and mountain terrain of the U.S. Southwest and northern Mexico constitute prime habitat for the remarkable Zone-tailed Hawk. Some of the world's most noted ornithologists have confounded this species with the Mexi-



Zone-tailed Hawk, *Buteo albonotatus*

can Black Hawk, but apparently small wild animals do not make quite the same mistake. Instead, they perhaps regard a soaring, rocking Zonetail as just another harmless soaring, rocking Turkey Vulture, and thus fail to take cover. By the time the rodent or lizard realizes its misidentification, it is gripped by talons far more piercing than those of the chicken-footed vulture. The foregoing theory that the Zonetailed Hawk is a mimic of the Turkey Vulture has been advanced by E. Willis and others. Genuine mimic or not, this hawk would seem to have derived little benefit from its apparent masquerade—the Zonetail is not, at least under modern conditions, a very successful species. Throughout the twentieth century, it has always been too few in number to form flocks; it is virtually always seen singly or in pairs.

In addition to hunting by flying low in Turkey Vulture-like glides, this bird is fully capable of sailing, in the manner of other buzzard hawks, on flat wings and spread tail. Not as restricted in its diet as are some Temperate Zone hawks, the Zonetail feeds on small mammals, lizards, frogs, fish, and an occasional bird. With as yet uninterpreted purpose, the Zonetail indulges at times in peculiar flight maneuvers. It sets its half-spread wings in the form of a triangle so the tips of the primaries meet behind. Keeping them so, it plunges from a great height nearly to earth with amazing velocity; often it sails away, remounts in the air, and repeats the performance. The spectacular nature of this display attracted the attention of Louis Agassiz Fuertes and the writer, H. C. Oberholser, when they were conducting ornithological explorations in the Big Bend in 1901.

Fuertes, Vernon Bailey, and the writer were camped at the mouth of Tornillo Creek east of the Chisos Mountains. A pair of Zonetails used this area and the canyon below as their rugged desert territory. Fuertes was exceedingly anxious to obtain a specimen for his collection. On the morning of May 27, he and Oberholser decided to spend the forenoon hunting along the top of the canyon below the mouth of the creek. Fuertes was to start out first and hunt along the canyon top and later meet the writer at a designated point, but when the time arrived, no Fuertes was in sight. The entire area was explored for some distance downstream to the first side canyon without any result. Loud calls also failed to produce any response.

Returning to the original rendezvous, the searcher waited for a time, then began to call again. At last, apparently from far away, a faint voice responded. Suspecting immediately that Fuertes might be in the canyon below, Oberholser hastened to the brink and looked over the edge. The cliff at this point rises almost perpendicularly several hundred feet above the Rio Grande. There, on a little ledge some thirty to forty feet below was the artist-naturalist.

On his way out from camp he had shot the wished-for hawk at the top of the canyon, but it had fallen over the edge and lodged on this little rock shelf.

It was impossible to reach the ledge from above, so Fuertes, in his eagerness, found the first side canyon and followed it until he came to a place permitting descent into the bottom. He followed this canyon down to the main level and then, by dint of carefully picking his way up the face of the cliff wall, he finally reached the place where lay the coveted hawk. At this point, however, his upward progress was completely halted by a considerable overhang of rocks; descent was equally impossible since he could not see where to secure foot-holds below. He was, therefore, imprisoned on this narrow ledge several hundred feet above the river with no possibility of climbing either up, down, or along the cliff.

When Oberholser discovered Fuertes, he first assured him he would soon bring help, then hastened back to camp. Fortunately Bailey had not yet left for his morning reconnaissance, and the two returned to the cliff with all the ropes available. These they tied together, one end fastened to a strong bush, and lowered to Fuertes, who looped the tow around his body. The two men on the cliff pulled, while Fuertes scrambled up the face of the cliff, using what little hold the rough rocks afforded. Finally they lifted him over the edge and up to level ground. His first act, when he was able to stand erect on the cliff top and take a deep breath, was to reach into a fold of his shirt and extract a beautiful adult Zone-tailed Hawk—which later that same day Fuertes sketched for the black and white wash that appears opposite.

The years since 1901 have been increasingly grim ones for nearly all beautiful forms of life on earth. But all is not yet lost; a pair of Zone-tailed Hawks, probably nesters, still frequented L. A. Fuertes' cliff in the summer of 1971, according to Roland H. Wauer, chief park naturalist at Big Bend National Park.

Screams of Zonetails, heard chiefly on nesting territory, somewhat resemble those of the Broad-winged Hawk but are lower pitched and more piercing.

CHANGES: Apparently the Zone-tailed Hawk has been slowly declining throughout the twentieth century. Today it would be unthinkable for this bird to nest on the eastern Edwards Plateau as it did, however sparingly, in the nineteenth century. Comal County, site of two yester-century nestings, is, in the twentieth century, overrun by thundering herds of people from the nearby cities of San Antonio, New Braunfels, San Marcos, and Austin. Besides this, the aridland Zonetail would have no business nesting in relatively humid Comal County, unless a flourishing population of the species were overflowing from the west.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN ZONE-TAILED HAWK, *Buteo albonotatus albonotatus* Kaup

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Upper parts rather brownish slate black; in life with slate gray bloom which largely disappears from museum

specimens; tail chaetura black with one or two rather broad bars of brownish light neutral gray, hair brown, neutral gray, or brownish deep neutral gray, these bars becoming white on inner webs of all but middle pair of feathers; tip of tail rather narrowly buffy white; wings like remainder of upper parts but rather more brownish, inner secondaries aniline black and secondaries broadly barred with light fuscous or hair brown; bases of feathers of anterior upper parts pure white; lower parts uniform, rather brownish, slate black, including lining of wings, with bloom in life similar to that of upper surface. Bill pale grayish blue or blue-gray at base, becoming plumbeous black at tip; inside of mouth pale yellow; iris blackish brown or hazel; eyelids dull neutral gray; cere and edge of mouth bright greenish yellow; legs and feet lemon yellow; claws plumbeous black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial*: Acquired by wear from first winter, with which it is practically identical. Iris dark brown. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adults, but plumage more brownish; inner secondaries and scapulars with more extensive purplish sheen (aniline black); scapulars and feathers of upper back with more or less concealed large white spots; inner webs of wing-quills broadly barred, except for tips, with white; tail dark grayish hair brown which becomes dull white on inner webs of feathers, except at tips, the central pair of feathers with numerous, sometimes rather narrow, bars of dark aniline black; upper tail-coverts laterally with mostly concealed white spots; anterior lower surface with white spots on edges of feathers, these mostly concealed. Bill black, but base tinged with dull green; cere yellow; iris brown; legs and feet yellow; claws black. *Juvenal* (second natal down of most authors): Dull white, but pileum, hindneck, and upper back between drab gray and pale smoke gray; lower back, rump, and lower surface tinged with gray, between drab gray and smoke gray. *Natal*: Unknown, but probably white or grayish.

MEASUREMENTS: *Adult male*: Wing, 384.0–392.9 (average, 388.6) mm.; tail, 215.9–222.8 (219.7); bill (culmen from cere), 21.1–23.4 (22.1); height of bill at base, 18.3–20.1 (18.8); tarsus, 66.8–71.1 (69.6); middle toe without claw, 39.4–44.7 (42.2). *Adult female*: Wing, 408.9–421.9 (417.8); tail, 224.8–234.4 (228.9); bill, 22.6–25.4 (23.9); height of bill, 20.1–21.6 (20.6); tarsus, 73.2–77.5 (74.4); middle toe, 42.2–48.0 (45.7).

RANGE: Identical with that of species in United States, Mexico, and Central America.

TEXAS: *Breeding*: Collected in Jeff Davis, Presidio, Brewster, Sutton (eggs), and Kerr cos.; formerly in Taylor (eggs) and Comal (eggs) cos. *Winter*: Taken in Cameron Co.

NESTING: *Nest*: In woods, commonly in trees along streams; bulky platform of large sticks; lined with weeds, leaves (usually green), moss, bark, and animal fur. *Eggs*: 1–4, usually 2; ovate or short ovate to oval or elliptical oval; smooth, not glossy; dull white or pale bluish white; marked with chestnut or amber brown, chiefly on larger end, sometimes with shell markings of lavender; occasionally unspotted; average size, 54.1 × 42.2 mm.

ROUGH-LEGGED HAWK, *Buteo lagopus* (Pontopidan)

SPECIES ACCOUNT

See colorplate 6

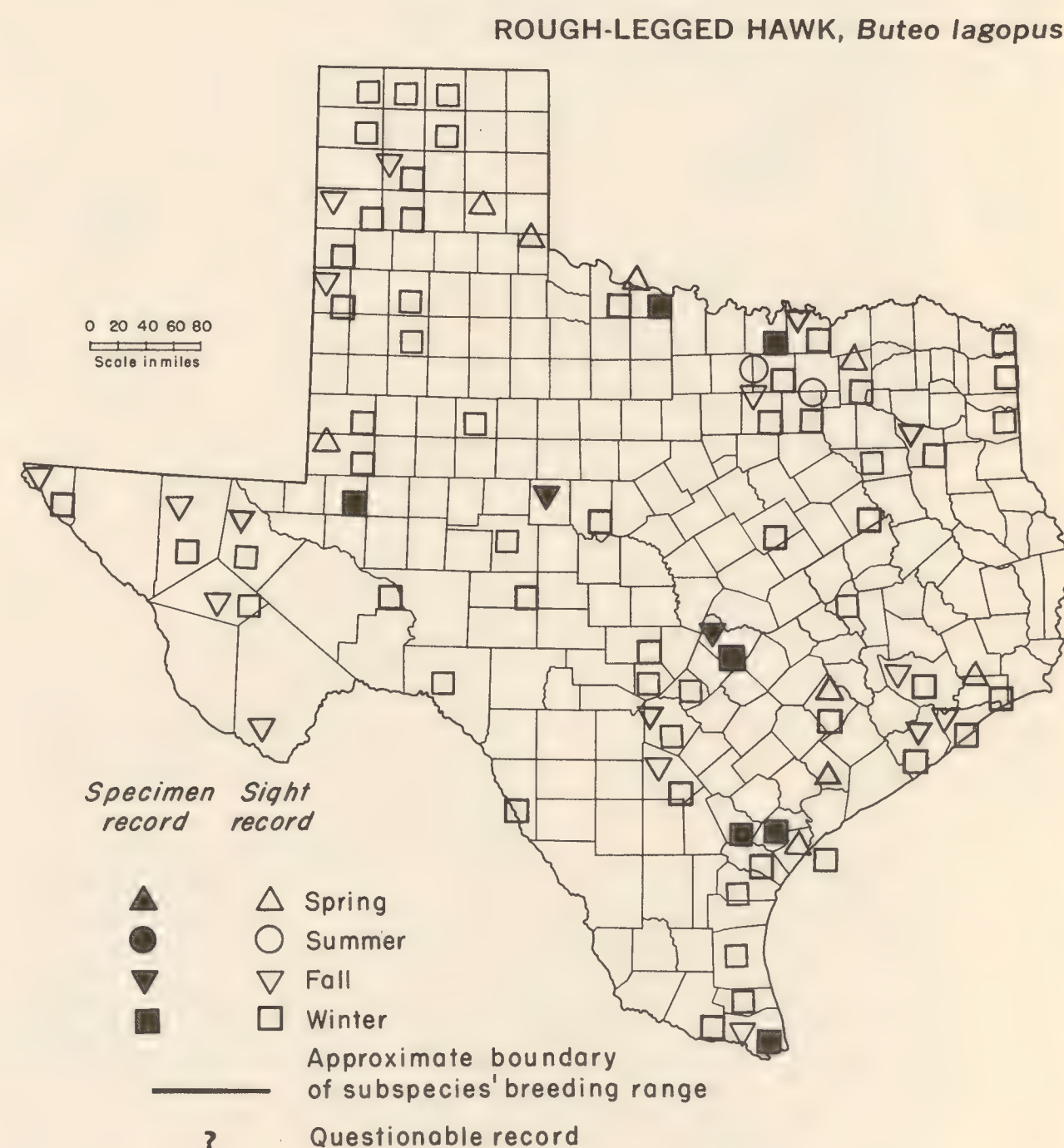
Rough-legged Buzzard of Old World authors. A large buteo with long wings and tail; legs feathered to toes. Plumage highly variable, but usually shows whitish at base of primaries on upperwing (visible in flight), and blackish band very near tip of whitish tail. *Adult (light phase)*: brown-streaked buffy head and nape; blackish back; blackish-streaked buffy below with blackish belly; in flight, reveals black-edged whitish underwings with black carpal-patches

(“wrists”). *Adult (dark phases)*: blackish above and below; tail sometimes blackish with several narrow irregular whitish to brown bars; in flight, shows dark brown wing-linings and black-tipped white flight feathers. *Immature (light phase)*: dark areas generally paler; black belly variable. Length, 21¼ in. (male), 23 (female); wingspan, 4¼ ft. (male), 4½ (female); weight, 2 lbs. (male), 3 (female).

RANGE: N. Holarctic, from approximately lat. 76° N., south to Aleutian Islands, c. Canada, s. Scandinavia, c. Siberia, and Kamchatka Peninsula. Winters chiefly in United States, c. Europe, Black Sea region, n. Iran, China, and Japan.

TEXAS: (See map.) *Winter*: Late Oct. to late Apr. (extremes: Oct. 11, July 28). Locally fairly common to uncommon (though irregular) in Panhandle; scarce to rare over rest of state.

HAUNTS AND HABITS: The Rough-legged Hawk is the northernmost-ranging of buteos; it has considerable need for its densely feathered (“rough”) leggings. On the arctic breeding grounds, this hawk inhabits more or less flat tundra, hills, mountains, and the northern edge of boreal forest. The standard nest, often repeatedly used, is a moss- and grass-lined platform of sticks variable in size and shape; it is commonly built either on a high ledge of a steep cliff or in a high crotch of a stunted or dead tree. Roughlegs retreat in fall with snowfalls that conceal much of their rodent prey and return again with spring thaws. Like most far-northern animal populations, Roughleg numbers fluctuate, but since its arctic nesting grounds have as yet (1971) been relatively undisturbed by civilization this species still recovers from its cyclic busts. Abundance of *Buteo lagopus* in the United States depends on northern food supplies. In



lean lemming years, more Roughlegs can be expected to move south, which helps account for the species' erratic occurrences in Texas. During the cool months here, as elsewhere, it hawks along rivers, preferably those with some timber, and on open plains and coastal prairies. It is a solitary buteo; however, during migration birds occasionally travel in loose flocks.

The Roughleg is a slow but powerful and graceful flier. Transients generally soar high and take advantage of favorable thermal updrafts. A hunter, often at twilight, moves from fifty to two hundred feet above the ground in glides interspersed with flaps; often it brakes in mid-air and wind-hovers momentarily as it looks below for rodent activity. When prey is sighted, it plummets swiftly on partially closed wings to seize its victim. Individuals also perch very erectly on a fence post or dead limb of a low tree and scan surroundings. In lieu of lemmings, field and other mice are chief winter food; it also eats ground squirrels, pocket gophers, a few insects, and some carrion.

In its northern haunts, usually about the aerie, the Rough-legged Hawk loudly squeals and mews. Courtship conversation, as a pair circles in the sky, is soft, rather musical, plaintive whistles.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN ROUGH-LEGGED HAWK, *Buteo lagopus s. johannis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Head and nape buffy white, streaked with cinnamon and fuscous; remainder of upper parts fuscous to fuscous black, more or less mixed with hair brown, streaked and more or less mottled with dull white, pale buff, and cinnamon; upper tail-coverts broadly barred and tipped with white; base of tail white, with hair brown spots, mostly along shafts of feathers; terminal portion of tail with irregular bars of fuscous black, and two intermediate bars of hair brown which become whitish on inner webs of outer feathers and more or less mixed with cinnamon and pale buff; tip of tail brownish white; wing-quills fuscous, outer webs hair brown barred with fuscous, but most of inner webs, except terminal part, white with rudimentary fuscous bars next to shaft; exposed surface of wings like back, anterior lesser wing-coverts with much admixture of tawny; lining of wing mostly fuscous with streaks and mottlings of white, russet, and tawny; sides of head and of neck, chin, throat, and breast white, buffy white, or cinnamon buff, much streaked with fuscous (narrowly on chin and cheeks, heavily on jugulum), these streaks broad and triangular, or in shape of spots on jugulum and breast; abdomen and sides fuscous, more or less mixed with whitish and cinnamon; abdomen and thighs mostly cinnamon, tawny, and russet, mixed with white and barred or spotted with fuscous; crissum almost immaculate buffy white. Bill bluish black, light grayish blue basally; cere and rictus pale pea green or yellow; iris dark brown, hazel, golden brown, or yellow; unfeathered eyebrow plumbeous; legs and feet yellow; claws bluish black. *Adults, nuptial (dark brown phase):* Upper parts, including wings and tail, fuscous black, fuscous, clove brown, or olive brown, sometimes more or less mottled or streaked with cinnamon or tawny; tail with narrow more or less irregular bars (about 4 or 5) of white to hair brown; wings similar to wings of light phase but less extensively and purely white on inner webs of wing-quills; lower parts and lining of wing dark brown like upper surface. Bill black, basally light blue; iris burnt umber; eyebrow olivaceous; cere and rictus chrome yellow. *Adults, nuptial (ochraceous phase):* Similar to light phase but most of light areas of upper parts and lower parts cinnamon, orange cinnamon,

or tawny. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults in corresponding phase. *Second nuptial:* Acquired by wear from corresponding phase in second winter, with which it is practically identical. *Second winter (light phase):* Acquired by complete postnuptial molt. Similar to first winter light phase, but head and neck less brownish, more buffy, thus lighter; upper parts dark brown, feathers edged with tawny; lower parts light buff or buffy white, heavily marked with bister, white part of tail with only spots instead of bars, and dark half of tail with bars of gray. Bill black, but base of mandible grayish blue; iris hazel; bare eyebrow plumbeous; cere and corner of mouth pale greenish yellow; toes light lemon yellow. *First nuptial:* Acquired by wear from first winter. Similar to first winter in corresponding phase. *First winter (juvenile plumage of most authors) light phase:* Acquired by complete postjuvenile molt. Similar to adults in light phase, but usually more buffy on under surface; terminal portion of tail hair brown or light fuscous, not barred; dark brown markings of abdomen more confluent and more inclined to form continuous dark brown band across body. Bill black, light grayish blue on basal half of mandible; cere and corner of mouth olive yellow, gamboge yellow, or light yellowish green; inside of mouth and tongue dark gull gray, but upper surface of tongue flesh color; unfeathered eyebrow plumbeous; iris raw umber or hazel; toes light lemon yellow or gamboge yellow; claws black. *First winter (dark brown phase):* Similar to adults in dark brown phase, but tail unbarred. Bill blackish brown; cere and gape greenish yellow; iris light brownish gray; feet wax yellow; claws black. *First winter (ochraceous phase):* Differs from adults in ochraceous phase as does first winter in light phase from light phase of adults.

MEASUREMENTS: *Adult male:* Wing, 397.0–416.1 (average, 407.2) mm.; tail, 210.1–232.1 (222.2); bill (culmen from cere), 20.9–23.6 (22.4); height of bill at base, 17.0–19.0 (18.3); tarsus, 65.8–75.7 (69.3); middle toe without claw, 32.0–38.6 (35.3). *Adult female:* Wing, 395.0–437.9 (407.4); tail, 214.1–234.7 (225.1); bill, 21.6–26.2 (23.6); height of bill, 18.0–20.1 (18.8); tarsus, 66.0–72.2 (69.1); middle toe, 31.8–36.8 (34.3).

RANGE: N.w. Alaska, n. Mackenzie, Victoria Island, n. Keewatin, Southampton Island, s.w. Baffin Island, and n. Labrador, south to n. British Columbia, n. Manitoba, and Newfoundland. Winters chiefly from s. British Columbia, s. Saskatchewan, s. Quebec, and Maine to California, n. Texas, Oklahoma, Missouri, and Virginia.

TEXAS: *Winter:* Taken north to Wichita, east to Cooke, south to Travis, Refugio, and Cameron, west to Ector cos. Several birds found dead (specimens?) in Palo Duro Canyon, Randall and Armstrong cos. (1936, J. O. Stevenson).

FERRUGINOUS HAWK, *Buteo regalis* (Gray)

SPECIES ACCOUNT

Ferruginous Rough-legged Hawk of some authors. A very large, long-winged buteo; legs feathered to toes. All phases show whitish tail; and upperwing with whitish at base of primaries (visible in flight). *Adult (light phase):* black-streaked whitish head and neck; black- and buff-tipped russet back and shoulders; mostly blackish wings; white below (abdomen may be barred and mottled with cinnamon) with finely black-barred rufous thighs; in flight, legs form a dark V against light body and underwings. *Adult (dark phases):* body plumage dark brown or rufescent brown; in flight, whitish tail and flight feathers contrast with dark wing-linings. *Immature (light phase):* dark brown above; tail sometimes with a few vague dusky bars; white below (including thighs), sparingly blackish-flecked. Length, 22¼ in. (male), 24¼ (fe-

male); wingspan, 4½ ft. (male), 5 (female); weight, 2½ lbs. (male), 3¾ (female).

RANGE: E. Washington, s. Alberta, s. Saskatchewan, and s.w. Manitoba, south to e. Oregon, Nevada, Utah, New Mexico, n.w. Texas, and w. Oklahoma. Winters chiefly in the U.S. Southwest, and to Baja California, Durango, Zacatecas, Guanajuato, Coahuila, and Hidalgo.

TEXAS: (See map.) *Breeding*: Apr. to July (eggs, May 6 to June 2) from about 1,200 to about 4,700 ft. Formerly irregular over much of northern and middle Panhandle east to Wilbarger and Shackelford cos.; retreating northwestward. Six records: Shackelford Co., 7 mi. south of Fort Griffin (nest and eggs found, June 2, 1886, E. C. Davis); Wilbarger Co., Vernon (nest with egg, Apr. 29, 1937, R. L. More); Deaf Smith Co., Glenrio (eggs, May 6, and 16, 1920, young in nest, May 25, 1920, A. J. Kirn); Oldham Co., 6 mi. east of Boise (nest with young, May 24, 1920, Kirn); Moore Co. (found nesting, 1939, P. F. Allen); Dallam Co. (nest found, Apr. 14, 1966, L. R. Wolfe). Prior to 1939 a rare visitor during breeding season to Trans-Pecos. *Winter*: Oct. to Apr. (extremes: late Aug., May 18). Locally fairly common to scarce and somewhat irregular over western third; uncommon to rare eastward to about 96th meridian, growing scarcer southward (exclusive of coast); uncommon on lower coast; rare on central and upper coasts.

HAUNTS AND HABITS: *Buteo regalis*—largest of its genus in the United States and indeed a regal hawk—ranges wide open spaces of the dry Great Plains and Great Basin in western North America. An abundant supply of small rodents appears to be a prime requisite in its choice of haunts; suitable nest sites are found either in the tallest timber bordering rivers or lakes or

on bouldery cliff ledges or buttes in treeless badlands. During cool months, most birds leave northern sectors of the breeding range and move to prime winter grounds in deserts and grasslands of the Southwest and northern Mexico. Solitary individuals, resting or alert for prey, are most frequently observed perched on a low tree, telephone pole, fence post, or on the ground.

When taking off, the Ferruginous Hawk, like most other buteos, is rather lumbering, but shortly it reveals its grace in the sky. It soars to great heights, at times on almost motionless pinions. In search of food, it sweeps low to flush prey out of grass, or flying higher, it frequently wind-hovers while minutely eyeing the ground below. When a ground squirrel, rabbit, prairiedog, pocket gopher, or mouse is spotted, the bird drops immediately from the air to capture it in its talons. Maximum size of prey is about that of a small jack rabbit. Snakes, lizards, crickets, grasshoppers, and beetles also are eaten; very rarely—usually to feed its nestlings—it takes a meadowlark, young magpie, or other small bird.

The gull-like cries of the Ferruginous Hawk, uttered most frequently near the nest, include a loud *kree-a* or *ke-a-ah* and a harsh, coughing *kaah, kaah*.

CHANGES: In common with numerous other fine northern-nesting birds, the Ferruginous Hawk has spent most of the twentieth century retiring from Texas as a breeder. According to available records, the southeasternmost nest of *Buteo regalis* was a little south of latitude 33° north in 1886. In 1937, southernmost point was north of 34° N.; by 1939, the Texas southern nesting limit was just under 36° N. The only recent (1966) breeding record in the state was north of 36° N. in the farthest reaches of the northwestern Panhandle. Next southeasternmost nesting of the species is likely to be northwest of the Lone Star State.

As a migrant and winter visitor, *Buteo regalis* has its ups and downs, but surprisingly it had a good year as recently as the winter of 1970–71. For this season, *American Birds* (successor to *Audubon Field Notes*) reported that 10 of the 53 Texas Christmas Bird Counts found a total of 23 Ferruginous Hawks—an impressive figure for this late in the degenerate twentieth century.

Warming of the Texas climate during the first fifty years of the twentieth century probably was a factor in Ferruginous nesting fade-out. Very likely a much more potent cause was man's near-extirpation of prairiedogs (*Cynomys*) over the entire range of *Buteo regalis*. *Homo sapiens* has killed all but a pitiful few hundred of America's, and the world's, original five billion wild "dogs." In the name of growing more grass to feed more livestock to feed more people—and also to eliminate horse-crippling holes—nearly 800,000,000 prairiedogs in the Texas Panhandle and associated plains alone were slaughtered between 1880 and the early 1970's by federal (chiefly U.S. Biological Survey) and private animal poisoners. The "dog" population

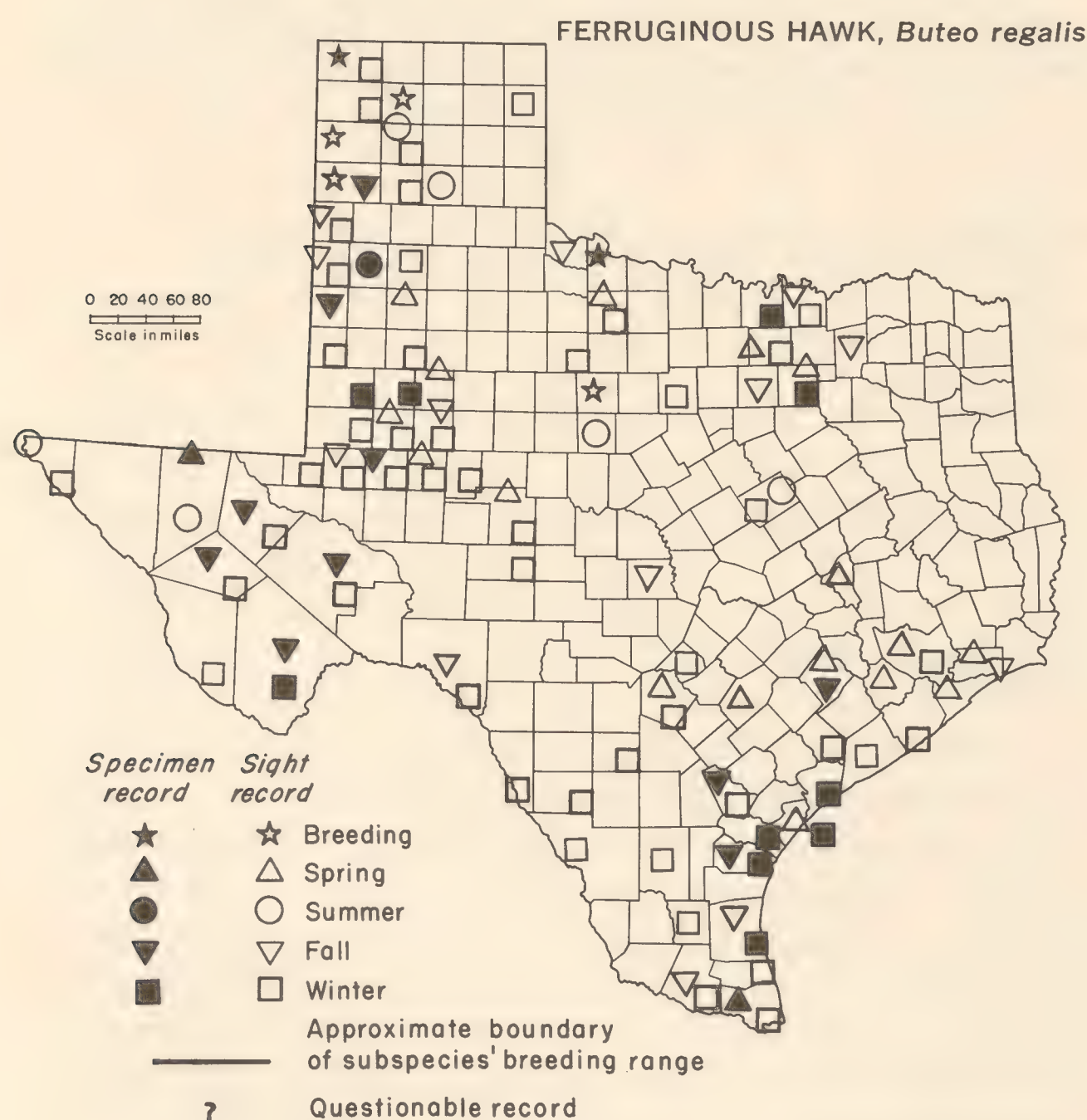




PLATE 6: Rough-legged Hawk, *Buteo lagopus*
light phase (foreground), dark phase (left background)



PLATE 7: Golden Eagle, *Aquila chrysaetos*

continues (into the 1970's) to be exceedingly oppressed and depressed; there are only a few widely scattered villages left—such as the semicaptive exhibit in Mackenzie State Park in Lubbock, Texas. *Cynomys* was a major staff of life for the Ferruginous Hawk. It is remarkable that this bird was able to survive such a drastic reduction in its food supply. Without the colossal prairiedog towns and cities of yestercenury, however, *Buteo regalis* numbers will remain low.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Upper parts fuscous to fuscous black, pileum streaked narrowly with cinnamon, pale buff, and white, bases of all feathers pure white, back broadly streaked or mottled, sometimes extensively, with cinnamon buff, russet, and pale buff; rump and middle tail-coverts mostly russet, feathers with fuscous or fuscous black centers; tail light hair brown to light drab gray, washed and mottled with cinnamon or russet, particularly on edges of feathers; tips of primaries fuscous black, outer webs of remainder of wing-quills fuscous or hair brown, inner webs mostly white, except at tips, inner secondaries with some imperfect bars of fuscous or hair brown, outer webs of outermost primaries for most of length hoary neutral gray; upper wing-coverts like back, but anterior lesser coverts almost solidly russet; scapulars white basally, exposed surfaces terminally like back; sides of head and of neck white, numerously streaked with fuscous, chaetura drab, and dull cinnamon; lores dull grayish white; lower parts white, but chin and throat often narrowly streaked with fuscous or dull cinnamon, breast with narrow shaft streaks of same, and abdomen with narrow bars and mottlings of cinnamon, russet, and fuscous, crissum sometimes buffy white; thighs russet and cinnamon, numerously barred with clove brown or fuscous; lining of wing white, broadly streaked with russet, fuscous, and hair brown, edge of wing almost immaculate. Bill slate color or black but base pearl gray; tongue mouse gray; edges of mandible bright yellow; inside of the mouth either pearl gray or purplish flesh color, somewhat bluish at corner of mouth; cere greenish yellow or sulphur yellow; iris light yellow, pale broccoli brown, or light or dark ochraceous brown; legs and feet bright yellow or sulphur yellow; claws black. *Adults, nuptial (dark phase):* Upper parts nearly uniform dark brown, varying from clove brown to olive brown, with buffy brown edgings; tail fuscous to hair brown, inner webs largely white, imperfectly barred or mottled with same color; outer edges of primaries, except at tips, hair brown, on inner webs largely white without bars, secondaries white on inner webs, with irregular, rather narrow bars of fuscous or olive brown; entire lower surface like upper parts, but rather paler anteriorly, and on throat and chin sometimes more or less streaked with dull buffy white; under wing-coverts clove brown and hair brown. *Adults, nuptial (rufous phase):* Like dark phase, but dark brown areas more rufescent. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults in corresponding phase. *Third nuptial (light phase):* Acquired by wear from third winter. Much like light phase of nuptial adults, but lower parts less extensively white, with more dark brown markings; more gray or tawny mixture on tail; upper surface also darker. *Third winter (light phase):* Acquired by complete postnuptial molt. Practically same as third nuptial. *Second nuptial (light phase):* Acquired by wear from second winter, with which it is practically identical. *Second winter (light phase):* Acquired by complete postnuptial molt. Similar to third winter, but upper parts still darker, with less white; abdomen and flanks more tinged with tawny and barred with dark brown or black; tail more mottled or suffused with gray or tawny. *First nuptial (light phase):* Acquired by wear from first winter. Similar to first winter, except for possible paling due to wear. *First winter* (juvenal plumage of most authors) *light phase:* Acquired by complete

postjuvenal molt. Colors very much as in light phase of adults, but tail darker terminally; thighs white or buffy white, sparingly spotted with fuscous or hair brown; upper parts darker. Bill black, but base of mandible cinereous olive gray; inside of mouth and commissure canary yellow; iris brownish primrose yellow; legs and feet naples yellow; claws black. *First winter (dark phase):* Practically identical with adult in dark phase, except chin, throat, sides of head, and, to less extent, nape and forehead streaked rather broadly with dull tawny and rather dull orange cinnamon; jugulum broadly barred with same; feathers of posterior lower parts more or less tipped with white or dull buff. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Pure white. Maxilla slate black; mandible dull grayish white becoming slate color on cutting edges, and lilac gray at base; commissure (rictus) buff; cere primrose yellow; edge of eyelids olive; iris sepia; legs and feet cream color; claws black tipped with white. *Natal:* White; pileum, wings, and rump tinged with gray.

MEASUREMENTS: *Adult male:* Wing, 421.1–439.9 (average, 431.0) mm.; tail, 231.1–246.1 (237.2); bill (culmen from cere), 26.2–30.5 (27.9); height of bill at base, 22.1–24.9 (23.4); tarsus, 83.1–87.6 (85.9); middle toe without claw, 36.1–43.9 (38.9). *Adult female:* Wing, 427.0–450.1 (434.8); tail, 238.5–252.0 (244.1); bill, 26.9–30.5 (29.4); height of bill, 23.1–26.4 (24.6); tarsus, 81.5–91.4 (86.9); middle toe, 37.1–43.4 (40.1).

TEXAS: *Breeding:* One summer specimen taken within recent breeding range: Lamb Co., 30 mi. south of Dimmitt (July 19, 1901, H. C. Oberholser). (See species account.) *Winter:* Taken north to Deaf Smith (Oct. 30), east to Cooke and Dallas, south to Calhoun and Cameron (Mar. 19), west to Brewster and Culberson (Mar. 5) cos.

NESTING: *Nest:* On prairies, banks of lakes, and plains, or in stream valleys, in tree or bush, or on ground; large bulky structure of sticks, weeds, grasses, bones, and dry turf; lined with leaves, bits of grass, roots, and weed stalks. *Eggs:* 2–5, usually 3–4; ovate to elliptical ovate; white, cream white, or greenish white; heavily blotched and spotted with many shades of brown, and with lavender and lilac shell markings; average size, 63.5 × 49.0 mm.

ROADSIDE HAWK, *Buteo magnirostris* (Gmelin)

SPECIES ACCOUNT

Insect, Large-billed, or Tropical Broad-winged Hawk of various authors. A small buteo with yellow to orange-red eyes; yellow cere and legs. Shows considerable racial variation. *Adult, northern subspecies (griseocauda):* grayish brown above; gray (rufous in several other races) tail with four black bands; grayish brown foreneck and breast, streaked with white on throat; white or buffy white belly and sides, heavily barred with rufous; white or buffy under wing-coverts, sparingly spotted with cinnamon; cinnamon to rufous primaries and secondaries, barred and tipped with black. *Immature:* mottled dark brown above; buffy below, streaked with dark brown on breast and irregularly barred with rufous on belly; tail similar to adult's. Young often confused with immature Gray Hawk, resident in same habitat; Roadside diagnosed by yellow eyes, and bold breast-streaks contrasting sharply with cross-barring on belly. Compare in all plumages with the strongly migratory Broad-winged Hawk. Length, 13–14½ in.; weight (2 females of *griseocauda*), 10¼, 11 oz.

RANGE: Tropical Mexico from Colima to s. Nuevo León and c. Tamaulipas, south through Central and

South America to c. Argentina. Accidental in Rio Grande delta of Texas.

TEXAS: *Accidental*: One record, first for United States: Cameron Co. (1 male collected, Apr. 2, 1901, probably by F. B. Armstrong). While examining hawks in the W. F. Henninger collection, Ohio State Museum, M. B. Trautman found the specimen (original no. 521) mislabeled *Buteo latissimus* (a 19th-century name for the Broad-winged Hawk), even though an older label (identification apparently by J. L. Peters) correctly listed *Rupornis magnirostris griseicauda* [sic] (as the Gray-tailed Roadside Hawk was then called). Trautman's reidentification was confirmed by Lester L. Short, Jr., of the U.S. National Museum; the record was published for the first time in the *Auk* 81 (1964): 435.

HAUNTS AND HABITS: Apparently the Roadside Hawk is little disturbed by man's civilizing effects in the tropical Americas. Nowadays it is common within its regular range. In tropical Mexico, beginning at the Río Corona, Tamaulipas, 180 miles southwest of Brownsville, Texas, the Roadside and Gray are generally the most numerous hawk species. *Buteo magnirostris* habitat is forest edge, open second-growth woods, tall brush, and stands of trees in cultivated areas along fences, roads, and streams. It ranges from lowlands to the slopes of hill country; however, as the land is cleared at higher altitudes, the hawk moves upward as well. Its nest, placed in a tree, is a rude platform of dried sticks, the shallow cup lined with dry leaves. The usual perch of a Roadside Hawk is at mid-level in a tree where foliage shades the bird from above but allows a clear field of view to the front and sides. It is an exceptionally tame hawk, allowing close approach when found at a perch and often flying up to investigate a bird watcher's squeaks.

This sluggish hawk soars only for brief periods, then with much flapping and never at great heights. Lizards, insects, scorpions, and spiders comprise a large part of the diet; rarely it takes a mouse or small (usually young) bird. Roadside Hawks are sometimes attracted to grass fires where small animals and insects are easy prey.

The common call of *Buteo magnirostris* is a whining, nasal *eeyaaaa* (also rendered *seeuu*) which is drawn out for about one second. Panamanians describe this squall as *cuisquí*—an onomatopoeic word which serves as the bird's local name. A series of staccato notes (*ke ke ke ke ke*, etc.) is infrequently uttered. Both vocalizations are sounded from a perch or when soaring.

DETAILED ACCOUNT: ONE SUBSPECIES

GRAY-TAILED ROADSIDE HAWK, *Buteo magnirostris griseicauda* Ridgway

Also called Mirador Insect Hawk.

DESCRIPTION AND MEASUREMENTS: See Friedman, 1950, *Bull. U.S. Nat. Mus.*, no. 50, pt. 11, pp. 338-341.

RANGE: S. Nuevo León and c. Tamaulipas, south to n. Veracruz (Río Seco).

TEXAS: *Accidental*: One specimen from Cameron Co. (see species account).

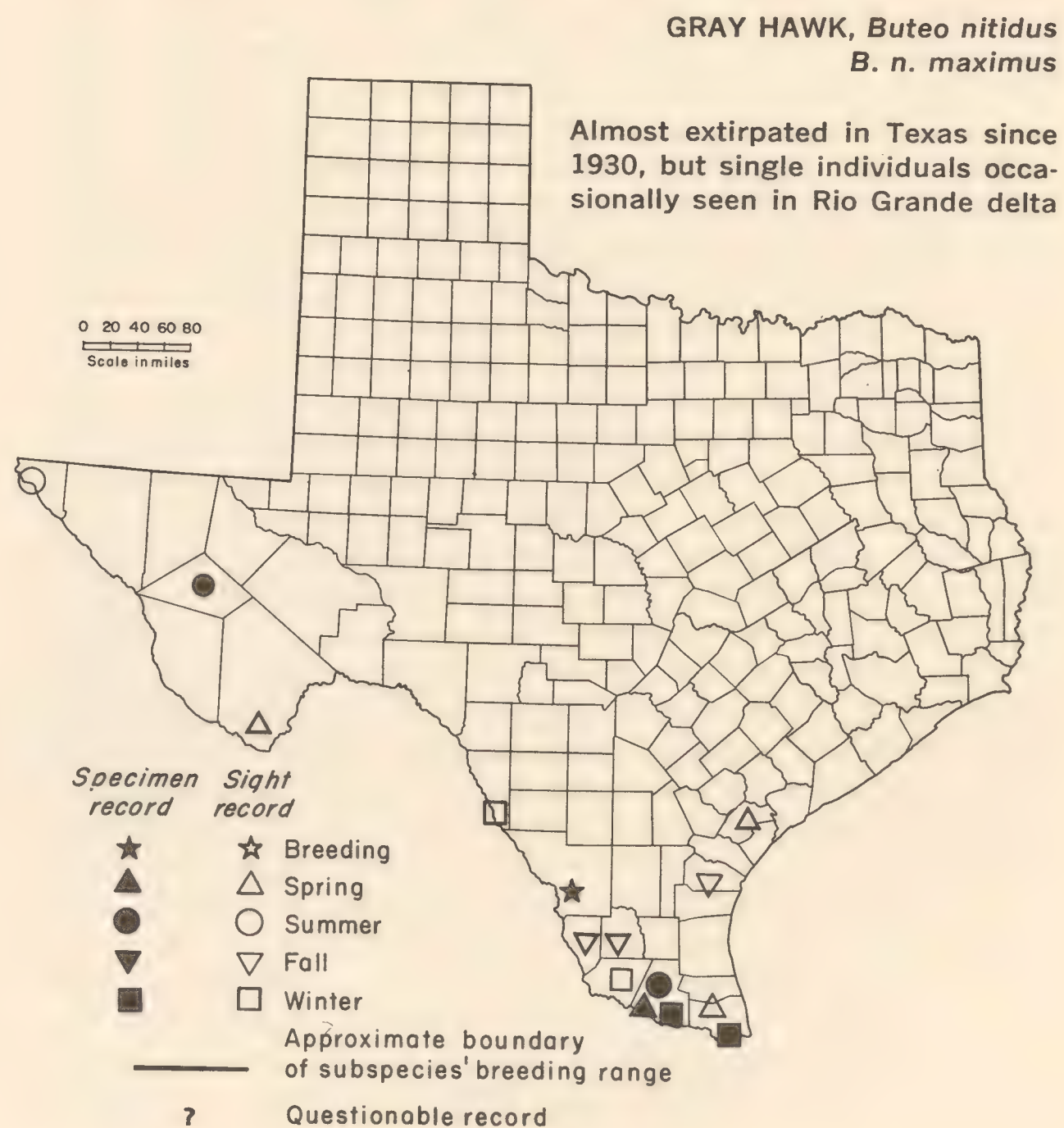
GRAY HAWK, *Buteo nitidus* (Latham)

SPECIES ACCOUNT

Mexican Goshawk of most older books. A small buteo with lustrous brown eyes; yellow legs and feet. *Adult*: gray above; white upper and lower tail-coverts; two conspicuous white bands on white-tipped blackish tail; finely gray- and white-barred under parts; in flight, shows grayish wing-linings in contrast to black-tipped whitish flight feathers. *Immature*: buff-mottled dark brown above; several obscure buffy brown bars on narrowly whitish-tipped dark brown tail; whitish (usually) or buffy below, streaked on breast and belly and barred on thighs with blackish. Length, 16¼ in. (male), 17½ (female); wingspan, 33¼ (male), 36 (female); weight, 1 lb. (male), 1¼ (female).

RANGE: Locally and irregularly on U.S.-Mexico border, south through mainland Mexico and Central America to e. Bolivia, n. Argentina, Paraguay, and Brazil (south to Rio de Janeiro). Migratory in extreme northern portion of range.

TEXAS: (See map.) *Breeding* (formerly): Three nesting records, all from Webb Co.: eggs obtained (Feb. 2, and May 8, 1892, G. B. Benners collection); eggs taken near Orvil (Feb. 3, 1913, E. F. Pope). Formerly may have occurred during breeding season from mouth of Rio Grande upriver to Eagle Pass: 1 seen in Cameron Co., near Harlingen (May 8, 1937, H. C. Blanchard); 2 specimens taken in Hidalgo Co., Lomita Ranch (Feb. 16, and Aug. 23, 1880, M. A. Frazar). One recent summer sighting: Hidalgo Co., Santa



Ana Nat. Wildlife Refuge (1 immature, June 12, 1972, Cruz Martinez). *Winter*: Early Sept. to mid-Mar. (extremes: Aug. 8, May 15). Rare and highly local in Rio Grande delta; in last quarter century, sightings confined almost exclusively to two Hidalgo Co. localities: Santa Ana Nat. Wildlife Refuge (where scarce and regular some winters) and Bentsen-Rio Grande Valley State Park. Casual at Eagle Pass (Dec. 26, 1954, M. K. Rylander; Dec. 21, 1958, Mrs. D. O. Worrell). *Vagrant*: Casual wanderer to central coast (Corpus Christi, Oct. 27, 1945, F. M. Packard; Refugio Co., Mar. 14, 1968, F. G. Evenden) and to Trans-Pecos (Brewster Co. sightings, late Mar., 1970, Apr. 3, 1970, and Apr. 14, 1967, fide R. H. Wauer; Jeff Davis Co., Limpia Canyon, 1 found dead, Aug. 27, 1969, Tony Mulhagen; El Paso Co., El Paso, June 5, 1933, A. H. McLellan).

HAUNTS AND HABITS: The trim Gray Hawk—which used to be called Mexican Goshawk because of its prevalence in Mexico and its goshawklike color pattern—is a neotropical buteo whose northern breeding range dissolves along the U.S.-Mexico border; however, in recent years this dissolvment has occurred short of Texas. Mature woodlands of river valleys and nearby semiarid mesquite and scrub grasslands are *Buteo nitidus* haunts in the Southwest. Thus, nesters in Texas were restricted to the cottonwood- and willow-lined lower Rio Grande from Webb to Cameron counties. The present species is not as migratory as some other of the broad-winged buzzard hawks, but the few birds which occupy the slim U.S. range in Arizona and New Mexico largely withdraw into Mexico for the winter. However, nowadays in Texas, the extremely few individuals which cross the Rio Grande mostly do so in the cooler months.

Flight of this active bird of prey is rather swift and more falconlike than that of most other buteos. Between forays, the retiring and solitary Gray Hawk often perches high in a tree, somewhat concealed by the foliage; consequently it is not so easily observed as those hawks which sit on exposed vantages. Lizards are preferred prey, but snakes, insects, rodents, frogs, and, to a lesser extent, small birds are taken also.

A noisy hawk, especially about its nest, the Gray gives a loud *kree-ee-ah* and other screams. Flutelike notes, suggestive of the call of the Long-billed Curlew, are sounded during what is apparently the hawk's nuptial flight.

CHANGES: The Gray Hawk—or at least “the little grey hawk”—figures prominently in “Lasca” (1882), a poem by Frank Desprez, perhaps the most famous poet of old-time Texas. By the teens of the twentieth century, *Buteo nitidus* was too rare in the Lone Star State to rate much prose, far less any verse. Status of the Gray Hawk in Texas has been highly similar to that of the Mexican Black Hawk. Both species formerly nested in trees on the floodplain of the lower Rio Grande and both wintered in the state. In recent years, both have become increasingly rare winter visitors only; however, the Gray Hawk's similarity to the

Broad-winged Hawk has generated a number of warm-season sightings that should be viewed with a skeptical eye.

Differing pressures for the decline of the two birds apparently are well suggested in Tamaulipas, Texas' neighbor-state to the southwest. In the late 1950's and through the 1960's, there was a general collapse of *Buteogallus anthracinus* in Tamaulipas. This downfall was not shared by the Gray Hawk; as late as July, 1970, *Buteo nitidus* seemed as numerous as ever in uncut woodlands and tall brush, especially along the Río Corona (E. B. Kincaid, Jr., et al.). The suggestion is that the Mexican Black Hawk, feeding as it does on crabs, fish, and other aquatic life known to concentrate pesticides, is being poisoned, as well as eliminated by tree clearing. In contrast, the Gray Hawk, which avoids aquatic prey as well as highly pesticided agricultural land, is hit chiefly by habitat reduction—one strike against it, instead of two.

DETAILED ACCOUNT: ONE SUBSPECIES

SONORA GRAY HAWK, *Buteo nitidus maximus* (van Rossem)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts, including wings, neutral gray to deep mouse gray, with darker obscure bars and shaft streaks, but rump brownish black, shorter upper tail-coverts dark mouse gray, and longest upper tail-coverts white; extreme forehead paler than crown, sometimes almost white; tail dull black with two exposed broad bars of white, proximal one broken, a basal bar or row of spots on at least inner webs of feathers, and a light grayish brown tip, terminally dull white; tips of primaries fuscous black, edges of inner webs basally white with narrow irregular hair brown bars which also cross outer webs but here become obscured; tips of secondaries and inner primaries dull white; crissum and chin white; latter often washed with gray; remainder of under surface rather brownish neutral gray, barred throughout with white, these bars broadest on abdomen, narrowest on thighs, and least evident on jugulum and upper throat, where plumage appears nearly unbarred; lining of wing white with numerous narrow bars of dull neutral gray, edge of wing practically unmarked. Bill black or bluish black, but base plumbeous; cere and corner of mouth wax yellow; eye-ring yellow; lores plumbeous; iris dark brown; legs and feet wax yellow; claws black or blue-black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but somewhat darker and more uniform above, narrow bars on upper surface more obscure; forehead not whitish; chin and upper throat little, if any, whitish; lower parts darker due to broader gray between white bars, this particularly noticeable on jugulum. *Male and female, first nuptial:* Acquired by wear from first winter, with which it is practically identical, except for occasional fading which produces somewhat lighter colors. *Male, first winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Upper parts between olive brown and fuscous, head and hindneck with some streaks of buffy white, cinnamon, and tawny; longest upper tail-coverts white with fuscous black centers; tail between clove brown and fuscous with several rather broad bars of buffy brown or light olive brown, these bars becoming white on edge of inner webs of feathers, and a narrow dull white tip; wing-quills between olive brown and buffy brown, becoming basally white on inner webs, and with some tinge of light pinkish cinnamon and narrow, rather regular bars of fuscous or clove brown; upper surface of wing like back, but exposed portions of wing-coverts more or less edged or tipped with buffy or cinnamon; lower parts pale buff; sides of neck and breast more or less mixed with cinnamon and

tawny; throat narrowly, breast and jugulum broadly, streaked with clove brown or fuscous, abdomen with large spots of same color, thighs with narrow bars of same; crissum immaculate; lining of wing buffy white, with a few spots or imperfect bars of hair brown. Bill bluish black, more bluish at base; cere and rictus dull yellowish green; iris brown; legs and feet dull greenish yellow; claws bluish black. *Female, first winter*: Similar to first winter male, but usually somewhat lighter in coloration. *Juvenal* (second natal down of most authors): Probably similar to natal. *Natal*: White, back washed with light gray, lower portion even more so. Bill black; cere yellow; eyelids and lores cobalt blue; iris grayish brown; legs and feet yellow; claws black.

MEASUREMENTS: *Adult male*: Wing, 250.5–272.0 (average, 259.1) mm.; tail, 151.1–186.9 (173.5); bill (culmen from cere), 20.1–24.4 (21.6); height of bill at base, 18.0–21.1 (18.8); tarsus, 69.1–74.9 (72.7); middle toe without claw, 34.0–41.4 (36.8). *Adult female*: Wing, 275.1–289.1 (282.2); tail, 175.0–195.1 (186.7); bill, 22.6–24.9 (23.6); height of bill, 18.0–22.1 (20.3); tarsus, 71.1–79.5 (75.7); middle toe, 39.9–43.9 (41.7).

RANGE: Locally and irregularly on U.S.-Mexico border from s. Arizona and s.w. New Mexico to s. Texas (formerly), south in lowlands and foothills to Nayarit, Nuevo León, Tamaulipas, and San Luis Potosí. Winters chiefly from Sonora, Nuevo León, and Tamaulipas to Colima, Guerrero, and Oaxaca.

TEXAS: *Breeding* (formerly): See species account. *Winter*: One 19th-century specimen: Cameron Co., Brownsville (Dec. 5, 1885, H. P. Attwater). One 20th-century specimen: Hidalgo Co., Santa Ana Nat. Wildlife Refuge, North Lake Trail (of 2 birds that spent winter 1970–71, 1 of them—a male—collected, Mar. 15, 1971, fide W. A. Shifflett; U.S. Nat. Museum, no. 564795).

NESTING: *Nest*: In timber, usually along streams; in top of tree, sometimes high above ground; rather small, poorly constructed platform of sticks, twigs, and leaves; lined with small twigs, cottonwood, mesquite, or other leaves, often green. *Eggs*: 2–3, usually 2; ovate, elliptical ovate, elongate ovate, or oval; white or pale bluish white; usually unmarked, but occasionally with a few buffy brown spots; average size, 51.1 × 40.9 mm.

BROAD-WINGED HAWK, *Craxirex platypterus* (Vieillot)

SPECIES ACCOUNT

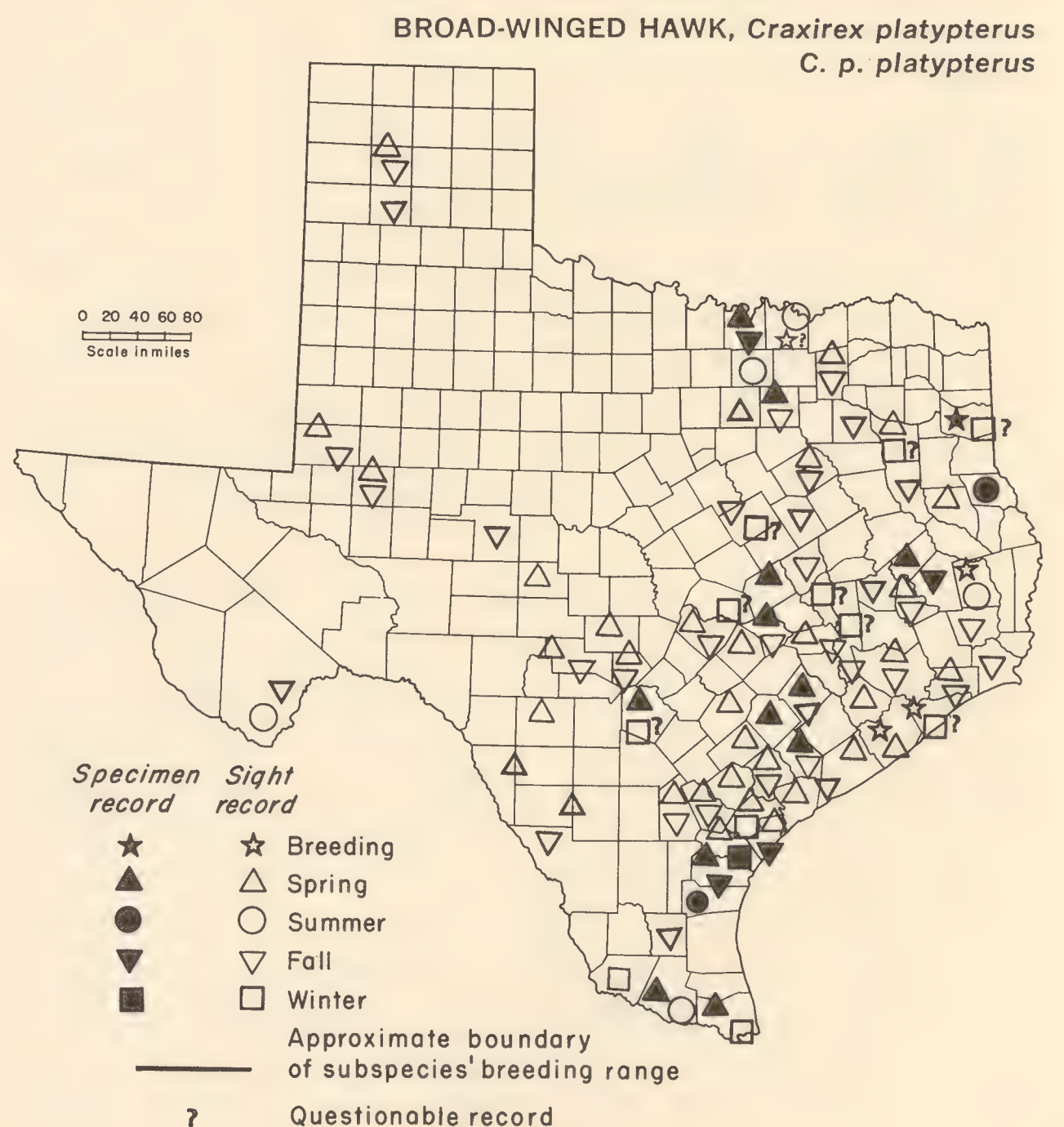
Buteo platypterus of A.O.U. check-list, 1957 (see Appendix A). A small buzzard hawk with exceptionally broad wings and relatively short tail. *Adult*: dark brown above; blackish tail with two conspicuous broad white bands; finely white- and rusty-barred below; in flight, shows white underwings with black-tipped primaries. *Immature*: dark brown mixed with cinnamon above; tail numerous and narrowly barred with dark brown and white; brownish-streaked buffy below; underwings as in adult. Length, 15¼ in. (male), 16½ (female); wingspan, 35 (male), 36½ (female); weight, 13 oz. (male), 19½ (female).

RANGE: C. Alberta, c. Manitoba, n.e. Quebec, s. Ontario, and Nova Scotia, south (east of Great Plains) to e. Texas, Gulf states, and Florida; also Cuba, Puerto Rico (rare), Antigua, and Dominica to Tobago. Mainland race winters chiefly from Guatemala to Colombia, Venezuela (including Trinidad), n. Brazil, and Peru; also Florida Keys (a few).

TEXAS: (See map.) *Breeding*: Six records: Harrison Co., Marshall (eggs taken, Mar. 19, 1918, A. D. Martin); Tyler Co. (nest found, early 19th century, E. F. Pope); Galveston Co., Dickinson (nest with 1 young,

Apr. 7, 1939, and nest with eggs, Apr. 5, 1940, T. C. Meitzen); Brazoria Co., 4 mi. southeast of Pearland (nests with eggs, Apr. 15, 23, 1940, L. H. Meitzen). Said to breed in Grayson Co. (fide U.S. Fish and Wildlife Service). The few summer records since 1941 may indicate extremely rare and local breeding in east Texas woodlands. *Migration*: Late Mar. to early May; early Sept. to mid-Oct. (extremes: Mar. 9, May 18; Aug. 28, Nov. 11). Irregularly abundant to scarce (migrates in large flocks) over eastern half west to Gainesville, Fort Worth, Waco, Austin, San Antonio, and McAllen; scarce to rare west of above line to Midland vicinity, Edwards Plateau, and southwest Texas; very rare in Big Bend (seen every spring and fall since 1966, fide R. H. Wauer) and in northern Panhandle. *Winter*: Nov. to Feb. (extremes: Nov. 17, Feb. 26). Very rare and irregular over eastern half.

HAUNTS AND HABITS: The Broad-winged Hawk is a small reclusive raptor of deciduous eastern American forests, where many of its shadowy haunts are shared with another common woodland mouse eater, the Barred Owl. The Broadwing often goes unobserved on its breeding grounds, but when stiff northwest winds signal the end of summer, birds take to the flyways in large flocks—at times in company with Cooper's, Sharp-shinned, Red-tailed, Red-shouldered, Rough-legged, and other hawks. Most famous locality to view transient birds of prey is Hawk Mountain, Pennsylvania, but as Frances J. Gillotti well demonstrated in the 1950's, the hilly Balcones Escarpment in central Texas is also a good region in which to observe migrating Swainson's and Broad-winged hawks. The main trick is to take your eyes off the ground and look high. Thermal updrafts assist Broadwings in their 4,000- to 5,000-mile migration to Central and South American



wintering places. With spring they return again by regular flyways along river valleys, mountain ridges, or coastlines. Observers in Central America and the United States find that the birds avoid sustained flights over large bodies of water.

This crow-sized hawk glides tirelessly on short broad wings; in forest retreats, however, it is much more sedentary. If disturbed from its roost, it flaps away heavily through the trees much like an owl. Most hunting is done from a perch rather than from the air. Motionless, a Broadwing sits on a dead stub or tree limb and eyes the forest floor for passing prey; when something is spied—usually a snake, shrew, mouse, grasshopper, cicada, or cricket—it springs suddenly, snatches it in its talons, then transports the catch to the feeding perch. Broadwings also eat frogs and crayfish, as well as a few young of small forest birds. Tiny objects are swallowed whole; larger animals are beheaded and skinned or partially defeathered. This very tame hawk often gives the impression of sluggishness and, although somewhat vocal if disturbed at the nest, is rarely aggressive.

Soaring about its breeding grounds, a Broad-winged Hawk whistles a plaintive, high-pitched *pwee-e-e-e-e* which suggests the call of a Wood Pewee but is more monotone and less accentuated; John Burroughs described this cry as a smooth, ear-piercing *su-eeee-oh*.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BROAD-WINGED HAWK, *Craxirex platypterus platypterus* (Vieillot)

DESCRIPTION: *Adults, nuptial plumage (brown—normal—phase):* Acquired by wear from winter plumage. Upper parts olive brown, fuscous black, and clove brown, darkest on back, palest on rump and nape, feathers mostly with paler brownish tips, feathers of nape edged with dull light buffy or cinnamon buff, feathers of occiput with white bases; upper tail-coverts broadly barred and tipped with white; tail fuscous black with two broad bars of drab, rufescent hair brown, light drab, or brownish drab gray, these becoming white or nearly so on inner webs of feathers, and a tip of white; wings like upper parts; wing-quills fuscous black terminally, with very narrow tips of brownish white and with broad fuscous bars on inner webs, except terminally, and basally becoming white on inner webs, this extending nearly to tip of inner secondaries; secondaries barred with hair brown on outer webs; upper wing-coverts like back; sides of head like nape but very finely streaked with fuscous and with a broad blackish rictal stripe; sides of neck and of jugulum tawny, russet, or cinnamon with shaft streaks of fuscous and spots of buff or dull white; chin and upper throat white, faintly streaked with clove brown; rest of lower surface pale buff or buffy white, very heavily barred, except on crissum, with olive brown to russet, which becomes more rufescent posteriorly and on middle of breast, crissum with a very few imperfect bars of hair brown or dull cinnamon; lining of wing white or pale buff, spotted or barred with cinnamon and hair brown. Bill blackish slate or black, but mandible, except tip, together with sides of base of maxilla, plumbeous; cere apple green, greenish yellow, or chrome yellow; iris canary yellow, straw yellow, tawny olive, light brown, brownish white, hazel, or dark brown; legs and feet wax yellow or chrome yellow; claws black. *Adults, nuptial (tawny phase):* Similar to brown phase, but anterior upper parts strongly tinged with tawny, including streaks on nape. *Adults, nuptial (black phase):* Upper and lower parts mostly brownish black, almost uniform, varied to some extent by dull white and rufous; white bars on pri-

maries and secondaries similar to those of brown phase. *Adults, winter (brown phase):* Acquired by complete postnuptial molt. Similar to nuptial adults, but colors somewhat richer. *Second nuptial (brown phase):* Acquired by wear from second winter. Similar to second winter but somewhat lighter. *Second winter (brown phase):* Acquired by complete postnuptial molt. Similar to adults in winter, but bars of upper parts very light gray or light brown; upper tail-coverts tipped with white; lower parts pale buff or buffy white, with longitudinal streaks made up of reddish brown spots, breast and legs sometimes somewhat barred with reddish brown. Bill black, plumbeous at base; cere yellow; iris pale yellow, straw yellow, gray, brown, or light amber; legs and feet yellow; claws black. *First nuptial:* Acquired by wear from first winter, to which it is similar except for paling due to wear. *First winter* (juvenal plumage of most authors) *brown phase:* Acquired by complete postjuvenal molt. Similar to brown phase of adults, but lighter bars of tail darker, rufescent hair brown, tinged on inner webs of feathers with pale buff; tip of tail brownish white; inner webs of secondaries with white bars more or less tinged with pale buff; wing-coverts tipped and margined with tawny, rufous, or cinnamon; lower parts cinnamon buff, broadly streaked with fuscous or fuscous black except on abdomen and crissum; lining of wing almost immaculate cinnamon buff. Bill black, but base plumbeous; cere greenish yellow or bright yellow; inside of mouth yellowish green; iris pearl gray, wood brown, or dark brown with lighter outer ring; eyelids olive green; legs and feet ochre yellow or greenish yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. White or barely tinged with buff or yellow. Bill bluish black; cere very pale yellow; inside of mouth, also legs and feet, flesh color; iris gray or dull bluish black. *Natal:* Buffy white, bases of feathers pale gray.

MEASUREMENTS: *Adult male:* Wing, 244.1–277.1 (average, 262.9) mm.; tail, 148.1–173.5 (159.0); bill (culmen from cere), 17.0–20.1 (18.3); height of bill at base, 16.0–17.5 (16.8); tarsus, 57.4–65.5 (62.2); middle toe without claw, 30.7–35.8 (32.5). *Adult female:* Wing, 264.9–295.9 (282.7); tail, 154.9–185.2 (171.2); bill, 17.3–20.6 (19.3); height of bill, 16.0–18.5 (17.3); tarsus, 58.9–66.3 (62.7); middle toe, 31.8–36.3 (33.8).

RANGE: Identical with that of species with exception of West Indies and Tobago.

TEXAS: *Breeding:* See species account. *Migration:* Collected north to Cooke, east to Polk, south to Aransas and Cameron, west to Hidalgo and Bexar cos. *Winter:* One specimen: San Patricio Co., Sinton (Dec. 12, 1959, B. Tutor).

NESTING: *Nest:* In woodlands on slopes or bottomlands, often near lake, river, or marsh; in tree or stub, sometimes in abandoned crow's nest; rather well constructed bowl with well-formed depression for eggs; composed of twigs, bark, moss, and similar materials; lined with grass, weeds, blossoms, green leaves, roots, moss, and feathers. *Eggs:* 2–5, usually 2–3; oval to elliptical ovate or ovate; white, bluish white, greenish white, or pinkish white; with spots and lines of various shades of brown, and shell markings of drab, gray, and lavender; average size, 48.5 × 39.1 mm.

[SHORT-TAILED HAWK, *Craxirex brachyurus* (Vieillot)]

Buteo brachyurus of A.O.U. check-list, 1957. A compact, small, short-tailed soaring hawk. *Adult (light phase):* dark brown above with white at base of bill; whitish tail with several (3 or 4) blackish bars (may be broken or absent in older birds) and a broader blackish subterminal band; white below; in flight, shows flashing white wing-linings and black-edged pale grayish flight feathers. *Adult (dark phase):* sooty black above and below, but retains white on forehead; in

flight, reveals blackish wing-linings (flight feathers and tail as in light phase). *Immature (light phase)*: more or less whitish-streaked dark brown above; 6 to 8 blackish bands of equal width on tail; buffy white below (including underwings), sometimes scantily blackish-streaked. *Immature (dark phase)*: buffy-mottled dark brown above and below; tail as in immature light phase. Length, 14–17 in.; wingspan, ca. 35; weight (1 immature male from Campeche), 12 oz.

RANGE: Rare and local in s. Florida, and from Tamaulipas through e. and s.w. Mexico and Central America to n. Chile, n. Argentina, Paraguay, and Brazil.

TEXAS: *Hypothetical*: Two sight records, neither substantiated by photographs: Aransas Co., near Port Bay, ca. 4 mi. west of Rockport (dark phase adult, Jan. 24–Mar. 7, 1954, Connie Hagar and Mrs. T. J. Richmond initially, later C. D. Brown and F. G. Watson; studied carefully on many days, often at close range); Hidalgo Co., Santa Ana Nat. Wildlife Refuge (1—apparently light phase adult, on Sept. 1, 1957, P. R. Lenna).]

SWAINSON'S HAWK, *Craxirex swainsoni* (Bonaparte)

SPECIES ACCOUNT

Buteo swainsoni of A.O.U. check-list, 1957 (see Appendix A). A medium-sized, rather lanky buteonine hawk with relatively narrow wings tapering to a dull point; glides with slight dihedral. *Adult (light phase)*: dark brown above; several narrow blackish bars (sub-terminal one broadest) on grayish tail; white below with contrasting brownish breast-band; in flight, reveals whitish wing-linings and dark brown flight

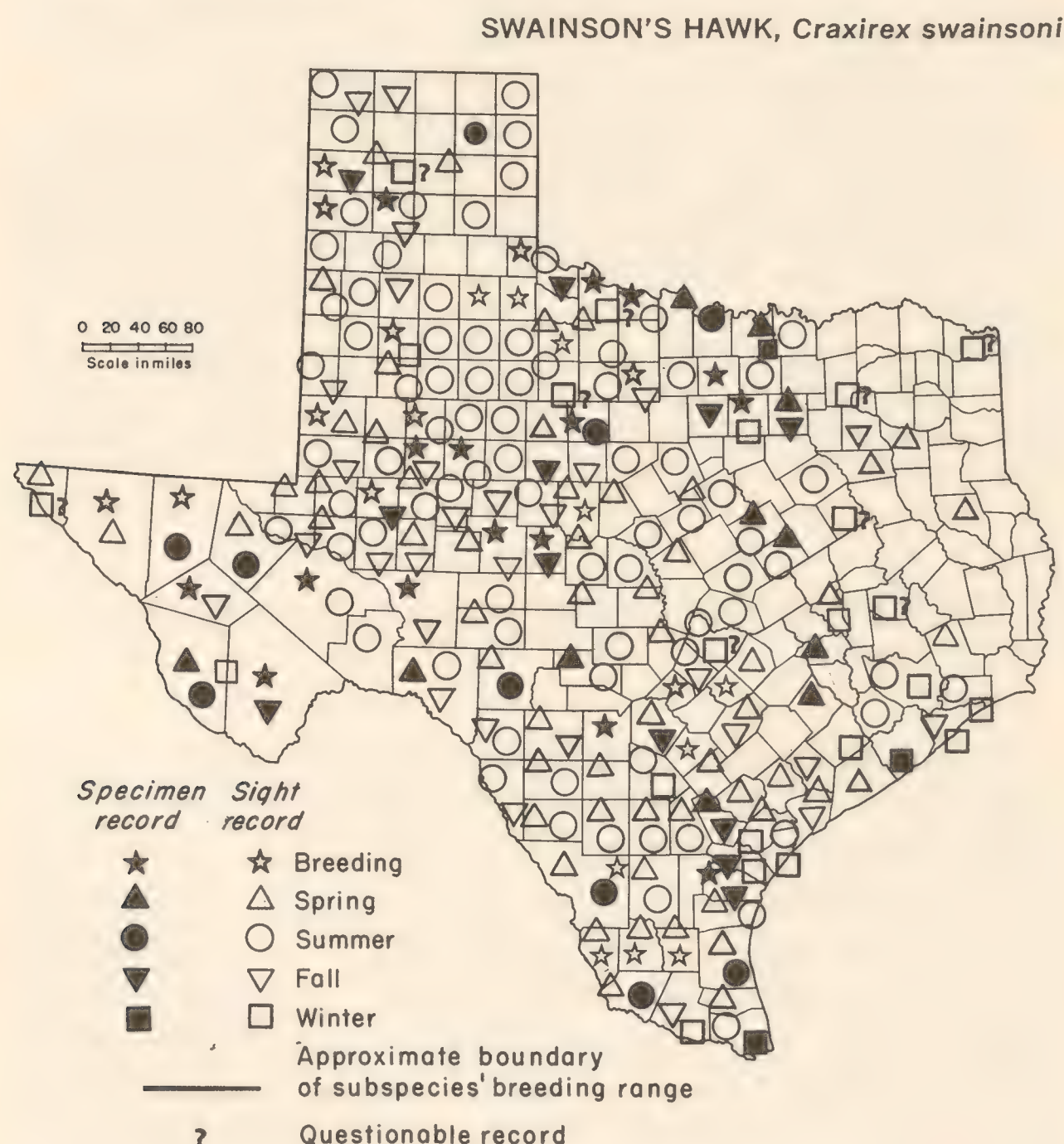
feathers. *Adult (dark phases)*: blackish brown above and below; tail as in light phase; underwings usually entirely dark brown. *Immature (light phase)*: dark brown above, whitish-streaked on head and neck; brownish-streaked buffy below. Much variance between color phases, but in all plumages (adult and immature) usually whitish (seen from above) at base of tail. Length, 20 in. (male), 21 (female); wingspan, 4 ft. (male), 4½ (female); weight, 2 lbs. (male), 2½ (female).

RANGE: Alaska, n.w. Mackenzie, Saskatchewan, and Manitoba, south across Great Plains to Baja California, Sonora, Durango, Chihuahua, and Texas. Winters chiefly on Argentine Pampas.

TEXAS: (See map.) *Breeding*: Late Feb. to Aug. (eggs, Mar. 1 to July 3; young in nest to Aug. 20) from near sea level to at least 6,000 ft. Uncommon to scarce and very irregular over Panhandle and Trans-Pecos; scarce to rare over remainder of western two-thirds east sporadically to Corpus Christi, Austin, and Dallas. Successful nestings were recorded even in south Texas brush country (Brooks and Jim Hogg cos.) as late as 1969 and 1970. *Migration*: Late Mar. to mid-May; early Aug. to early Nov. (extremes: Mar. 12, June 14; July 25, Nov. 12). Irregularly abundant to fairly common over western two-thirds (migrates in large flocks, especially in spring); most numerous from early Apr. to early May and from mid-Sept. to mid-Oct. Probably rare and irregular in east Texas (fide C. D. Fisher). *Winter*: Late Nov. to mid-Feb. (extremes: Nov. 18, Feb. 22). Scarce along coast from Cameron and Hidalgo cos. north to Chambers and Harris cos.; rare and highly irregular over remainder of western two-thirds; casual in Panhandle.

HAUNTS AND HABITS: One of the more common and conspicuous birds of prey of western North America, the Swainson's Hawk ranges wide open prairies, plains, deserts, and their scantily timbered water-courses; the species meets the southeastern boundary of its breeding range in the western two-thirds of Texas. Swainson's Hawks typically migrate to and from the chief winter grounds in Argentina in silent, soaring flocks of hundreds, or even thousands of individuals. In Texas, the present species and the Broad-winged Hawk—which at times fly together—are the only buteonine raptors which migrate in impressive aggregations; in the western half of the state, Swainson's numbers considerably exceed those of the Broadwing.

Once on the wing, the Swainson's Hawk is strong and swift, although its takeoffs appear heavy and awkward. The spectacular flights of migrants are, on sunny days, usually high in the air, where birds soar along, seldom flapping. They pass in long straggling lines or in clusters, which sometimes pause to wheel even higher on thermal updrafts. After a day of soaring, transients gradually lose altitude, like slowly deflating balloons, and come to rest often on bare open ground. The next morning these late risers usually wait for the sun to generate rising columns of hot air before they soar on. Many a Texas motorist has



been surprised to see a plowed field covered with these hawks; at such times every other clod and fence post seems to serve as a perch. Individuals are usually tame, especially when they have just flown in from Argentina on empty stomachs.

In search of food, a bird often spends hours on an exposed perch—a dead tree limb, edge of a cut bank, or telephone pole. Usually it returns with regularity and is rather protective of its repeatedly used vantage. Preying individuals, on occasion, fly low to the ground, much in the manner of a Marsh Hawk, with a slight dihedral of the wings. The Swainson's feeding habits are of much benefit to western farmers and ranchers; it eats prodigious quantities of grasshoppers and crickets, as well as rabbits, ground squirrels, rats, frogs, lizards, and snakes. Unlike most other hawks, the Swainson's feeds in large groups when copious food supplies are available. In fall, for example, birds amass on plots where vast numbers of grasshoppers congregate to lay their eggs. Apparently this raptor rarely, if ever, takes birds; in fact, it is noted for nesting harmoniously in close proximity—often in the same tree—with Mourning Doves, Western Kingbirds, House Sparrows, Bullock's Orioles, and House Finches, among others.

A shrill, plaintive *kreeeeeer*, sounded in air or from a perch, is the cry of the Swainson's Hawk.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Pileum and rump fuscous, forehead whitish, crown and occiput narrowly streaked with cinnamon and pale buff, bases of feathers of occiput pure white; hindneck mostly dull cinnamon and russet streaked with fuscous; remainder of upper parts, including wing-coverts, fuscous black, clove brown, or olive brown, with lighter buffy brown, tawny, cinnamon, or buff edges of feathers, giving plumage somewhat mottled appearance; upper tail-coverts hair brown, barred with fuscous, exterior feathers white on outer webs, somewhat tinged with cinnamon rufous or tawny and narrowly barred with fuscous; tail hair brown becoming darker terminally, with several narrow bars of fuscous and a broader bar of same near end narrowly tipped with brownish white, feathers becoming whitish on basal portion of inner webs of all but central pair of rectrices; wing-quills fuscous black, barred, except terminally, with hair brown which becomes paler and almost whitish on basal portion of inner secondaries; tertials tinged with cinnamon rufous or buff; sides of head dull white, finely streaked on cheeks and auriculars with chaetura drab; chin and upper throat white; jugulum and upper breast with broad band of mikado brown; sides of neck same but paler; remainder of lower parts white, lower breast, upper abdomen, sides, and flanks irregularly barred with dark pinkish cinnamon; thighs buffy white, narrowly and irregularly barred with cinnamon; crissum unmarked; lining of wing white, very faintly tinged with buff; axillars white with some spots or bars of dark pinkish cinnamon. Bill black or slate black, but base of maxilla deep gull gray, base of mandible and commissure Naples yellow; cere and angle of mouth Naples yellow, greenish yellow, or light dull lemon yellow; iris deep hazel, raw umber, dark vandyke brown, or burnt sienna; naked eyebrow olive yellow; legs and feet wax yellow or deep chrome yellow; claws black. *Adult female, nuptial (light—normal—phase):* Acquired by wear from winter. Similar to nuptial adult male, but band on upper breast and jugulum dull buffy brown; upper parts often darker than in male. *Adult male and female, nuptial (rufous phase):* Upper

parts similar to those in light phase but darker; chin dull white, heavily streaked with chaetura drab or fuscous; remainder of lower parts tawny or russet, very heavily barred on lower abdomen and thighs with ochraceous tawny; crissum cinnamon buff, lightly barred on longer feathers with dull cinnamon; lining of wing cinnamon buff, barred or streaked with cinnamon, tawny, russet, and hair brown. *Adult male and female, nuptial (dark phase):* Similar to rufous phase, but more uniform above with less admixture of tawny and buff, mostly clove brown to fuscous black; tail dark hair brown with several bars of fuscous or fuscous black; lower surface almost uniform dark brown, between clove brown and olive brown; lining of wing same color but with some bars and mottlings of cinnamon buff and russet; crissum pale buff or cinnamon buff, basally mixed with russet and more or less barred with fuscous. *Adult male and female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults in respective phase, but usually somewhat more richly colored, feathers of jugulum and upper breast, with those of mantle, tinged with rather light gray. *Male, third nuptial (light phase):* Acquired by wear from third winter. Similar to nuptial adult male, but posterior lower parts less whitish and with more dark markings. *Male, third winter (light phase):* Acquired by complete postnuptial molt. Similar to third nuptial male but somewhat more richly colored. *Male, second nuptial (light phase):* Acquired by wear from second winter. Similar to third nuptial, but colors generally darker; upper parts with many white or buff edgings; throat with dark brown streaks; broad band on jugulum and upper breast darker. *Male, second winter (light phase):* Acquired by complete postnuptial molt. Similar to second nuptial male but rather darker and more richly colored. *Female, third nuptial (light phase):* Acquired by wear from third winter. Similar to nuptial adult male in light phase, but with more dark brown markings on flanks, abdomen, and flags of legs. *Female, third winter (light phase):* Acquired by complete postnuptial molt. Practically identical with third nuptial female. *Female, second nuptial (light phase):* Acquired by wear from second winter. Similar to corresponding plumage of male but with more dark markings on lower parts. *Female, second winter (light phase):* Acquired by complete postnuptial molt. Practically identical with second nuptial female. *Male and female, first nuptial (light phase):* Acquired by wear from first winter. Similar to first winter, but colors somewhat lighter and duller. *Male and female, first winter (juvenal plumage of most authors) light phase:* Acquired by complete postjuvenal molt. Upper parts clove brown to fuscous black, much streaked on head and neck with white, pale buff, cinnamon, and cinnamon buff; upper tail-coverts white or pale tawny with narrow fuscous bars; tail and wings like adults; lower parts buffy white anteriorly; breast and posterior lower parts, including lining of wing, cinnamon buff or light buff more or less spotted and streaked on breast, jugulum, and upper abdomen with fuscous, these spots broadest and most conspicuous on jugulum. Bill dull black, light dull blue, or pale olive buff at corner of mouth and on basal half of mandible; cere pale yellowish green or sulphur yellow; iris cinereous or hair brown; legs and feet cream color or light grayish green; claws bluish black. *Male and female, first winter (dark phase):* Similar to adults in dark phase. *Juvenal (second natal down of most authors):* Acquired by postnatal growth. White both above and below. *Natal:* Yellowish white or grayish white, tinged with pale pinkish buff on head and middle of back.

MEASUREMENTS: *Adult male:* Wing, 362.0–406.1 (average, 383.8) mm.; tail, 184.0–214.1 (204.7); bill (culmen from cere), 20.6–24.6 (22.4); height of bill at base, 17.5–19.6 (18.8); tarsus, 63.2–72.7 (68.3); middle toe without claw, 36.8–44.2 (39.6). *Adult female:* Wing, 374.9–427.0 (404.9); tail, 193.8–233.9 (214.9); bill, 20.6–25.7 (23.6); height of bill, 19.0–21.1 (19.8); tarsus, 61.5–76.2 (69.8); middle toe, 38.4–46.5 (42.2).

TEXAS: *Breeding:* Collected north to Randall, east to Tarrant, south to Nueces and Webb, west to Brewster and Culberson cos. *Migration:* Collected north to Oldham, east to Cooke and Galveston, south to Cameron, west to Val Verde and Presidio cos. *Winter:* Three specimens: Cooke Co., Gainesville (Jan. 25,

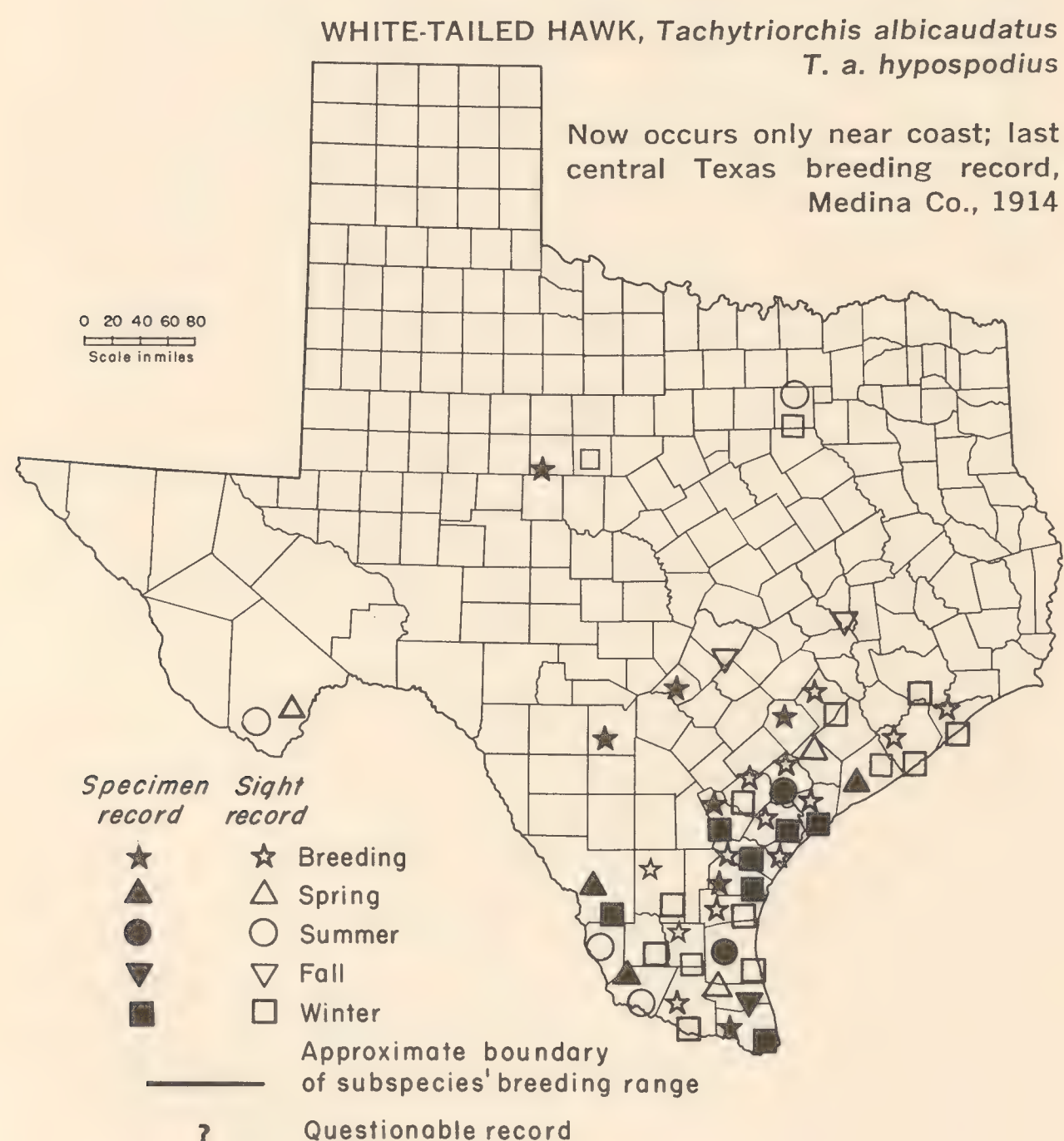
1878, G. H. Ragsdale); Cameron Co., Brownsville (Jan. 4 and 7, 1912, A. P. Smith). Other records (specimens?): Wise Co., Decatur (1 killed, Feb. 18, 1890, J. A. Donald); Brazoria Co., Manvel (1 found dead, Dec. 5, 1948, J. M. Heiser, Jr.).

NESTING: *Nest:* In open country, woodlands, edges of woodlands, fringes of timber along streams, or about cliffs; in tree, bush, yucca, occasionally on telephone pole or on ground, rarely in old nest of another hawk, sometimes 100 ft. above ground; rather bulky platform of sticks and twigs; lined with leaves, grass, weeds, and bark. *Eggs:* 2-4, usually 2; oval or short ovate; dull white, greenish white, or buffy white; blotched and spotted with reddish brown of various shades, clay color, different shades of gray or drab; sometimes unmarked; average size, 56.4 × 43.9 mm.

WHITE-TAILED HAWK, *Tachytriorchis albicaudatus* (Vieillot)

SPECIES ACCOUNT

Buteo albicaudatus of A.O.U. check-list, 1957 (see Appendix A). A large hawk with a short tail (when bird is perched, tail does not extend beyond wing tips). *Adult:* gray malar region, head, back; russet shoulder-patch; blackish wings; snowy white rump and tail, the latter with conspicuous black band very near tip; white under parts; in flight, reveals white wing-linings and dark grayish flight feathers. *Immature:* brownish black above, the russet patch less marked; brownish tail, numerously barred with darker brown, later becoming mottled grayish white with suggestion of the black subterminal band; variable below—from largely blackish brown with patches of whitish to pale buff with brown-barred abdomen. Length, 23 in. (male), 24 (female); wingspan, 4 ft. (male), 5 (female).



RANGE: Sonora, Arizona (at least formerly) and s. Texas, south chiefly in lowlands through Mexico and Central America to n. Colombia, Venezuela, and Amazon Delta of n. Brazil, also the islands of Aruba, Curaçao, Bonaire, Margarita, and Trinidad; and from approximately lat. 10° S. in Brazil through e. Bolivia, Paraguay, Uruguay, and Argentina to n. Patagonia.

TEXAS: (See map.) *Resident:* Breeds, late Jan. to July—exceptionally to late Aug. (eggs, Feb. 1 to Aug. 4) from near sea level to about 160 ft.—formerly about 1,700 ft. Uncommon to scarce and decreasing on upper (north to Galveston Co.) and central coasts; locally fairly common to uncommon on lower coast (inland to Bee and Duval cos.). Most recent good nesting year was 1969 (1 nest in Duval Co. produced 2 young; 2 nestings in Brooks Co. fledged 5, Mr. and Mrs. O. C. Bone). Formerly bred farther inland: Colorado Co., Eagle Lake (last breeding record, 1938, V. W. Lehmann); Lavaca Co. (last, 1913, E. F. Pope); Comal Co. (last, 1900, C. L. Cloetta); Medina Co. (last, 1914, E. F. Pope); and Taylor Co. (last, 1896, M. L. Judkins). *Vagrant:* Wanders northward irregularly during nonbreeding season to Harris Co., where rare; casual at Dallas and in Big Bend. Accidental in Brazos Co., College Station (Oct. 10, 1937, W. P. Taylor); Travis Co., Austin (Sept. 2, 1930, A. J. Kirn); and Callahan Co., Clyde (Dec. 1, 1969, Peter Alden).

HAUNTS AND HABITS: The neotropical White-tailed Hawk is exceedingly showy—probably the most beautiful American buzzard hawk. In present-day Texas it is a bird of coastal grassland—both saltgrass (*Spartina*) flats adjacent to Gulf of Mexico beaches and dry grassy mesquite-live oak savannah farther inland. Remnants of the first habitat can be seen near State Highway 35 in Aransas and Refugio counties between Copano Bay and Tivoli. Mostly intact coastal savannah can be viewed along U.S. 77 in Kleberg, Kenedy, and northern Willacy counties from Kingsville to Raymondville.

Like other buteonine hawks, the Whitetail rides thermals to great heights. When engaged in serious hunting, this bird flies between 50 and 150 feet above the prairie. If its keen eye glimpses anything interesting below, the hawk hovers helicopterlike. If either southeast sea breeze or norther be strong, the big raptor is able to remain stationary in the air for some minutes by facing into the wind and hanging spread eagle; in calm weather this bird has to flap considerably to remain aloft in one spot. When prey definitely reveals itself, the White-tailed Hawk drops. Often the animal slithers or scurries to safety before the bird arrives, in which happenstance the hawk checks its fall and flaps to regain altitude. If the raptor plunges all the way to the grass, it is quite likely, especially in summer, to pin a snake to the ground. After a few minutes, the White-tailed Hawk usually flies away carrying the reptile, either coiled in its talons or dangling in its beak. Other foods include rabbits, rats, mice, ground squirrels, lizards, frogs, and insects.

A rather musical, high-pitched *kil-la kil-la* series,



White-tailed Hawk, *Tachytiorchis albicaudatus*

suggestive of the call of a Laughing Gull, is the cry of the White-tailed Hawk.

CHANGES: Distribution of the White-tailed Hawk has changed considerably in Arizona and Texas since the white settlers began manipulating the landscape. Between 1899, the year of the last Arizona specimen, and the winter of 1954–55 when four individuals were seen, the species disappeared from Arizona. In recent years, sightings have become somewhat more frequent. The latest was of a bird viewed on the San Rafael grassland near Patagonia, Arizona, January 5–February 8, 1971.

During a roughly similar period of years (1890's through 1950's), the species faded out from the central and most of the southern parts of Texas and became a strictly coastal bird. In the 1960's, it recaptured a bit of its old inland Texas range but began declining as a breeder on the upper coast, probably in response to increasing industrialization and pollution.

What caused the range shrinkage and subsequent slight retaking of lost ground? Between 1880 and 1933 there was an expansion of thornbrush, chiefly mesquite, in Texas. Thousands of acres that had been more or less open prairie became thickets and even mesquite woodlands. Two leading theories have been advanced to explain the explosion of woody vegetation. The first holds that hordes of livestock introduced by early-day ranchers broke up the solid grass turf, thus allowing brush seeds (sometimes said to have been planted via cow droppings) to germinate and grow. The second theory holds that the ranchers' suppression of grass fires (formerly ignited by Indians and lightning) enabled woody vegetation to sprout and grow taller and denser year after year. Some theorists combine theories.

Starting in 1933 and surging on into the 1970's, brush eradication, financed in part by a U.S. Soil Conservation subsidy to ranchers, has become big business in Texas. Mesquite trees are sprayed with kerosene and a variety of far more deadly weed killers, such as 2,4,5-T. Bulldozers and tractors, some dragging anchor chains between them, topple and pull out trunks. Since 1945, gigantic root-plows have been yanking out and chopping mesquite roots to bits. As of 1971, most of the twenty million acres of mesquite and live oak woodlands in south Texas have been "treated." As a result, most of south Texas could nowadays be called a man-made bush savannah, the bushes being mostly second-, third-, and fourth-growth mesquite sprouts that have come up from seed, or from roots that root-plows have so far missed. Superficially, the twenty million acres have been returned to something approaching their condition when the White-tailed Hawk occupied most of them. In 1969, this hawk nested for the first time in recent years in Duval and Brooks counties on ranches cleared by machines. It is unlikely, however, that the species will reoccupy much more of its former breeding range. Since 1950, accelerating civilization, pollution, climatic cooling, and decline in the snake population would all seem to

counteract expansion of this tropical, snake-eating hawk. The population of the White-tailed Hawk is thin and will probably remain so.

DETAILED ACCOUNT: ONE SUBSPECIES

SENNETT'S WHITE-TAILED HAWK, *Tachytiorchis albicaudatus hypospodius* (Gurney)

DESCRIPTION: *Adult male, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Top and sides of head and of neck, with nape and back, neutral gray, lores and forehead whitish; rump, upper tail-coverts, and tail white or yellowish white, rump with narrow bars of hair brown, tail with broad subterminal band of fuscous black and narrow indistinct bars of hair brown on most of remainder of rectrices, except inner webs of feathers; primaries fuscous black to dull black, with broad bars of hair brown which become white on inner webs of outer feathers; secondaries similar to outer primaries and with brownish white tips; wing-coverts brownish deep neutral gray with lighter edgings and, in some cases, darker bars and shaft streaks; patch on anterior lesser coverts russet; scapulars washed with same color; lower parts white, sides, flanks, and thighs narrowly barred with hair brown or mouse gray; lining of wing white, narrowly barred with hair brown or mouse gray. Bill black, but base and commissure pearl gray; cere greenish yellow, pale green, or yellowish olive buff; iris raw sienna or hazel; legs and feet maize yellow; claws black. *Adult male and female, nuptial (dark phase):* Like light phase, but lower surface gray or slate color, posteriorly tinged with rufous; tail feathers white with eight narrow dark bars and a broad black subterminal band. *Adult male, winter (light phase):* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial (light phase):* Acquired by wear from winter. Similar to adult male but darker; russet of wings and scapulars more extended; anterior upper parts dark mouse gray, including exposed surface of superior wing-coverts, feathers of pileum, nape, and upper back with pure white bases; all inner anterior wing-coverts and most of scapulars russet; chin, with sides of head and of neck, dark mouse gray; lining of wing, thighs, and sides of abdomen more heavily barred with light russet, dull cinnamon, and hair brown. *Adult female, winter (light phase):* Acquired by complete postnuptial molt. Similar to nuptial adult. *Male, second nuptial (light phase):* Acquired by wear from second winter. Similar to nuptial adult male, but upper parts brownish black, feathers with broad tips of pinkish cinnamon; russet of lesser wing-coverts duller; scapulars, in part, barred or edged with same color; rump white, barred with dark brown and dull russet; tail much washed with gray; throat and sides of neck dark brown; abdomen barred with dark brown. *Male, second winter (light phase):* Acquired by complete postnuptial molt. Similar to second nuptial male. *Female, second nuptial (light phase):* Acquired by wear from second winter, with which it is practically identical. *Female, second winter (light phase):* Acquired by complete postnuptial molt. Similar to second winter male but somewhat darker, with more russet in wings and scapulars. *Male and female, first nuptial (light phase):* Acquired by wear from first winter, with which it is practically identical. *Male and female, first winter (juvenal plumage of most authors) light phase:* Acquired by complete postjuvenal molt. Upper surface blackish clove brown, anteriorly becoming clove brown on back and exposed surface of wings; head and neck slightly streaked with dull white or pale buff; wing-coverts and scapulars broadly tipped with cinnamon buff and cinnamon; rump and upper tail-coverts buffy white or cinnamon buff, broadly barred with clove brown; anterior lower surface mostly blackish clove brown; jugulum broadly streaked with cinnamon and cinnamon buff; breast barred or spotted with pale buff; lower abdomen, crissum, and thighs pale buff or cinnamon buff, with broad spots of clove brown; lining of wing buffy white or cinnamon buff, heavily marked with clove brown or blackish olive brown. *Juvenal (second natal down of most authors):* Acquired by postnatal growth. Upper parts, including

wings, sooty brown or mouse gray, becoming darker anteriorly and passing into dull buff behind; lower parts buffy white. Bill black above, light below; eyelids black; feet flesh color; claws light brown. *Natal*: Yellowish white; pileum with additional long down of bone brown or sepia terminally, back and wings with similar brown-tipped down.

MEASUREMENTS: *Adult male*: Wing, 400.0–430.0 (average, 416.1) mm.; tail, 167.9–188.0 (175.5); bill (culmen from cere), 23.6–26.9 (25.1); height of bill at base, 18.5–20.6 (19.8); tarsus, 85.6–96.0 (89.9); middle toe without claw, 39.9–46.0 (43.2). *Adult female*: Wing, 430.0–468.1 (444.0); tail, 173.0–210.1 (189.7); bill, 24.9–29.2 (26.7); height of bill, 20.1–23.1 (21.1); tarsus, 84.1–95.5 (89.4); middle toe, 39.9–48.0 (44.2).

RANGE: Sonora, Arizona (nested in 1897), and s. Texas, south locally on plains and foothills through Mexico and Central America to Ecuador, n. Colombia, and w. Venezuela.

TEXAS: *Resident*: Collected northeast to Colorado and Matagorda, southwest to Cameron cos.; formerly north to Starr, Webb, Medina (eggs), Taylor (eggs), and Comal (eggs) cos.

NESTING: *Nest*: On prairies, in brush, or in fringes of timber; in yucca, bush, or tree; large bulky platform, rather loosely constructed of sticks, weeds, and grasses; with a little lining of leaves, moss, and grass. *Eggs*: 1–3, usually 2; oval, elliptical oval, ovate, or elliptical ovate; dull grayish white; usually unmarked, but sometimes sparingly spotted with reddish brown, fawn color, and lavender; average size, 59.9 × 47.5 mm.

HARRIS' HAWK, *Parabuteo unicinctus* (Temminck)

SPECIES ACCOUNT

Bay-winged Hawk of some authors. A medium-sized buteolike hawk, but slightly slimmer and with longer tail. *Adult*: dark brown above and below; chestnut shoulders, thighs; in flight, shows chestnut wing-linings, dark brown flight feathers, and broad white band at base (both surfaces) of white-tipped blackish tail. *Immature*: cinnamon-tipped dark brown above;

numerous narrow, sometimes indistinct, blackish bars on brownish tail (base and tip whitish as in adult); brownish-streaked buffy below with russet-barred flanks; in flight, reveals pale cinnamon linings. Length, 20¼ in. (male), 22¼ (female); wingspan, 3¾ ft. (male), 4 (female).

RANGE: S.e. California to s. central Texas, south through Mexico and Central America to s. Chile, c. Argentina, and s. Brazil.

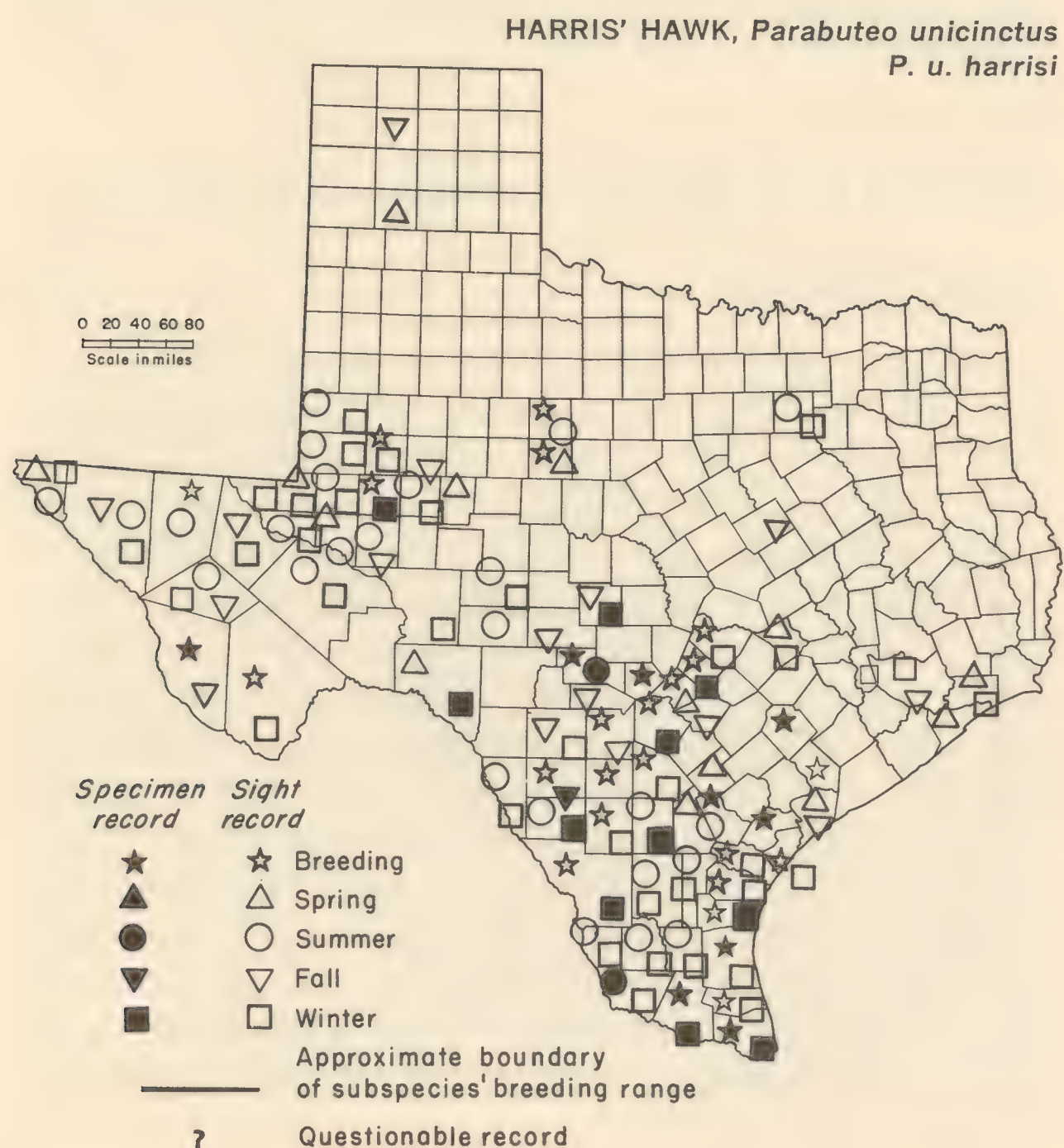
TEXAS: (See map.) *Resident*: Breeds, Jan. to Sept.—exceptionally to Nov. (eggs, Mar. 8 to Nov. 13; large young on nest as early as Feb. 17) from near sea level to 2,800 ft. Common to uncommon in Tamaulipan Biotic Province; uncommon to scarce and somewhat irregular on Edwards Plateau north to Schleicher, Mason, and Kendall cos.; fairly common to uncommon in southern Panhandle and Midland vicinity; scarce and irregular west of Pecos River. Apparently declining since mid-1960's, but some successful nesting into 1971. Formerly bred from New Braunfels to Austin and in Lavaca and Jackson cos. (latest: Hays Co., breeding ca. 1910, J. K. Strecker, Jr.; Jackson and Lavaca cos., nests found in both, 1905, J. D. Mitchell). *Vagrant*: Casual and irregular wanderer during nonbreeding season to upper coast, El Paso, northern Panhandle, Dallas, and Waco.

HAUNTS AND HABITS: Mesquite woodlands with pricklypear cactus, such as formerly stretched almost unbroken from San Antonio to the mouth of the Rio Grande, constitute prime habitat for the handsome Harris' Hawk. Far fewer numbers of this hawk range yucca-cactus-creosotebush deserts of the Trans-Pecos; a few even reside very locally on juniper-oak portions of the Edwards Plateau. Numbers increase again on the mesquite flatlands immediately northwest of the Plateau.

Because in flight it shows a white patch at the base of the tail—as does the Marsh Hawk—this raptor is often misidentified as such by tyro bird watchers. Actually, the much chunkier, darker Harris' chases rabbits and wood rats through and around thorny thickets, instead of flying low over extensive fields, prairies, and marshes. *Parabuteo unicinctus* is usually seen in loose twosomes or family parties at all times of the year. Pairs and their offspring, if any, typically perch a few feet or yards apart on dead limbs of trees or on the tops of telephone poles.

Flight of the Harris' is at times sluggish, but a hunting *Parabuteo* is swift, precise, and powerful. On hot sunny days, when thermals are good, this hawk soars with ease and grace high in the air, but, Black Vulture-like, it flaps heavily to get into soaring position. This bird seems to spend less time sailing around in rising columns of hot air than do most true buteos. It hunts usually in early morning or late afternoon; its unspecialized diet, in addition to rabbits and wood rats, includes mice, lizards, snakes, birds (night herons, teal, flickers, others). It cleans a bird victim thoroughly, especially plucking out the primaries.

A loud harsh *karr* is the usual, but seldom heard, cry



of the Harris' Hawk. A rather weak *eee eee eee eee* is sounded when the bird is disturbed.

CHANGES: The Texas portion of the Tamaulipan Biotic Province, roughly that part of the state south of San Antonio, contains about 21,888,190 acres. Between 1890 and 1933, approximately 20,000,000 acres were grown up to brushy mesquite (*Prosopis*) woodlands—grade-A habitat for Harris' Hawks; most of the remaining acres in this biotic province were visited at least occasionally by the species.

By 1971, this former Harris' Hawk paradise had been highly cut up. Clearings were utilized approximately as follows: 2,500,000 acres to cotton; 1,878,690 acres to hay and grain; 169,500 to vegetable farming; and 90,000 to citrus culture. Much of the remaining 17,250,000 acres had been de-treed, but not necessarily completely de-brushed, for "improved" pasture for livestock, roads, billboards, houses, and other clutter of civilization. As a result of this *Prosopis* eradication, habitat suitable for nesting and hunting has been greatly reduced. Harris' Hawks concentrating in remaining patches of woodlands—such as skirt roads on the King Ranch—give the illusion that they are as common as ever.

In 1971, Mr. and Mrs. O. C. Bone of Falfurrias checked 630 avian nests of all species in Brooks, Jim Wells, Duval, Jim Hogg, and Zapata counties. In this old Harris' Hawk stronghold they found not one nest of this species. According to the Bones, the Harris' has been decreasing at least since they started their annual nest surveys in 1969. Also in 1971, Gene Blacklock, who observes nesting activity in the Corpus Christi area, did not find any nests of this hawk. However, at the Santa Ana National Wildlife Refuge, Hidalgo County, where pesticide levels are on the high side, Harris' Hawks built two nests in 1971, one of which actually produced two young!

In 1972, Mr. and Mrs. Bone's report was somewhat more encouraging. In the same south Texas counties, they found 14 Harris' Hawks fledged from six nests. They speculated that removal of poisoned bait intended for coyotes might have had something to do with the successful season for *P. unicinctus*.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN HARRIS' HAWK, *Parabuteo unicinctus harrisi* (Audubon)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper parts clove brown; feathers of rump broadly edged and tipped with chestnut or bay; upper tail-coverts white with a few spots of dark brown; base and broad tip of tail dull white; remainder of tail, and primaries blackish brown; remainder of wings like back, except for lesser coverts and margins of greater and middle series which are tawny to chestnut; crissum white; remainder of lower parts clove brown; lining of wing and thighs chestnut. Bill dull bluish gray, tip dull black; cere, lores, eyelids, and edge of gape bright yellow; iris dark brown, hazel, or dull yellow; legs and feet bright yellow, orange-yellow, or dull yellow; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar

to nuptial adults. *First nuptial:* Acquired by wear from first winter. Similar to first winter, except for absence or reduction of buff edgings of feathers. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Upper parts clove brown to sepia, streaked with edgings of cinnamon, ochraceous tawny, tawny, and russet; upper tail-coverts cinnamon buff; base of tail white, mottled with blackish brown; tip of tail broadly white; wings like those of adult, but secondaries tipped with dull and pale buff or cinnamon buff, also chestnut lesser wing-quills with shaft streaks of clove brown; lower parts dull white or buffy white; crissum and breast pale cinnamon buff; lower parts broadly streaked, except on crissum, with clove brown or blackish clove brown; lining of wing cinnamon buff, broadly barred with auburn; thighs ochraceous tawny barred with cinnamon brown and russet; crissum practically unmarked. Cere yellow or yellowish green; iris chestnut brown; legs pale yellow. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Upper parts dull ferruginous, somewhat lighter below. Bill dull black, cere lemon yellow; iris chocolate brown; legs and feet lemon yellow; claws black. *Natal:* Upper parts pinkish cinnamon or pinkish buff; lower surface grayish white to buffy white. Bill light brown above, yellowish white below.

MEASUREMENTS: *Adult male:* Wing, 309.3–357.1 (average, 333.5) mm.; tail, 224.1–262.1 (246.4); bill (culmen from cere), 23.9–27.9 (26.2); height of bill at base, 19.6–22.6 (21.4); tarsus, 81.0–90.9 (86.1); middle toe without claw, 39.9–47.5 (43.9). *Adult female:* Wing, 332.0–362.0 (353.8); tail, 244.1–283.9 (279.1); bill, 23.9–28.9 (27.2); height of bill, 21.1–23.6 (22.9); tarsus, 80.0–91.9 (86.9); middle toe, 46.5–56.9 (51.8).

RANGE: S. New Mexico to w. and s. Texas, south through e. and s. Mexico and Central America to w. Ecuador, Colombia, and Venezuela.

TEXAS: *Resident:* Collected north to Midland, east to Mason, Hays, and Lavaca (eggs), south to Cameron, west to Presidio (eggs) cos.

NESTING: *Nest:* In brush, timber along streams, or similar woodlands; in bush or low tree; bulky, rather solid structure, though somewhat flat; made of sticks, weeds, leaves, grass, and other vegetation; bowl lined with roots, grass, and bark. *Eggs:* 2–5, usually 3; oval, ovate, or short ovate; smooth but not glossy; dull white with yellowish tinge or white and slightly greenish; sometimes unmarked but usually with dots and irregular markings of purplish drab, lavender, fawn color, and cinnamon; average size, 54.1 × 41.9 mm.

BLACK HAWK, *Buteogallus anthracinus* (Deppe)

SPECIES ACCOUNT

Common Black Hawk, Lesser Black Hawk, and Crab Hawk of various authors; northernmost population usually called Mexican Black Hawk. A rather large buteolike hawk, but even chunkier with broader wings and shorter tail. *Adult:* essentially black above and below with a broad white medial band on white-tipped tail; bright yellow cere, lores, gape; long, straw yellow legs; in flight, reveals whitish smear at base of primaries (smaller and vaguer than similar white patch on Black Vulture). *Immature:* dark brown above, broadly cinnamon-streaked on head and neck; 4 to 6 narrow buffy white bars on blackish tail; cinnamon buff below (including wing-linings), streaked on breast and barred on thighs with blackish; olive yellow cere, base of bill; greenish yellow legs. Length, 20½ in. (male), 22 (female); wingspan, 4 ft. (male), 4¼ (fe-

male); weight (1 female from Campeche), ca. 2 lbs.

RANGE: U.S.-Mexico border regions from s.w. Utah (Springdale), n.w. Arizona (Beaver Dam), New Mexico, and s.w. Texas (extremely local), south through mainland Mexico, Central America, and n. South America (chiefly coastally) to extreme n.w. Peru and n.w. Guyana, also St. Vincent and Trinidad; Cuba and Isle of Pines birds sometimes regarded as separate species (*gundlachi*). In winter withdraws from Utah, Arizona, New Mexico, and Trans-Pecos Texas.

TEXAS: (See map:) *Breeding:* Nesting records prior to 1940: Webb Co. (eggs collected, Apr. 15, 1913, E. F. Pope); Starr Co., along Rio Grande at Alamo Crossing (female collected and 1 egg obtained from nest, Apr. 25, 1891, D. B. Burrows); Cameron Co., lower end of Resaca De Los Fresnos, 3 mi. south of Laguna Atascosa (nest and 3 eggs, May, 1937, H. C. Blanchard). After an apparent 33-year retirement from nesting in the state, breeding birds were discovered in the Trans-Pecos: Jeff Davis Co., lower Limpia Canyon (pair nesting in cottonwoods, 1970, 1971, 1972, site found initially by Pansy Espy; birds and nest observed subsequently by R. H. Wauer and more than 15 other birders). *Winter:* Retreats from Trans-Pecos portion of range. Formerly resident from Webb Co., possibly Kinney Co., south to mouth of Rio Grande; since 1937, apparently only an increasingly rare winter visitor to former breeding areas in south Texas.

HAUNTS AND HABITS: *Buteogallus anthracinus* is the northernmost ranging of several confusingly similar species of lowland neotropical black-colored hawks. This raptor has a long history of being confounded with other birds of prey—even in the United States, where identification is vastly simpler than in Latin America. In Texas, many Zone-tailed Hawks, Harris'

Hawks, various melanistic buteos, and Black Vultures have been mistaken for Black Hawks. The basic recognition point to remember is that the present species suggests a Black Vulture, since it has a short tail and broad wings with a white spot at the base of the primaries. Both birds prefer low altitudes: In the 1950's, numerous individuals of each species resided in Veracruz coconut plantations only a few yards from the Gulf of Mexico's surf. For those who enjoy shaky theories, the senior editor hereby suggests that *Buteogallus anthracinus* is a mimic of *Coragyps atratus*.

Away from the seacoast in northern Mexico and up to desert lowlands of the Southwest, a few Black Hawk pairs find nesting habitat along cottonwood-lined rivers and streams. In south Texas, pairs formerly bred in willow tree groves on the lower Rio Grande floodplain. The increasingly few individuals seen since 1950—all nonbreeders—were mostly on the coastal prairie very near the Laguna Madre, where brush, chiefly mesquite, is too low to be called timber.

Soaring is most frequent during the breeding season. The Black Hawk has the habit of plunging from high in the air almost to the ground, as do some of the other large hawks, then checking its momentum near the surface and gliding away. Typically, the lethargic-mannered Black Hawk waits for prey while perched on a low, well-foliaged limb of a tree at water's edge or as it stands quietly on a sand or mud bar. In many areas, beach or land crabs are the chief food, but the bird also eats frogs, fish, crayfish, reptiles, small mammals, birds, and insects.

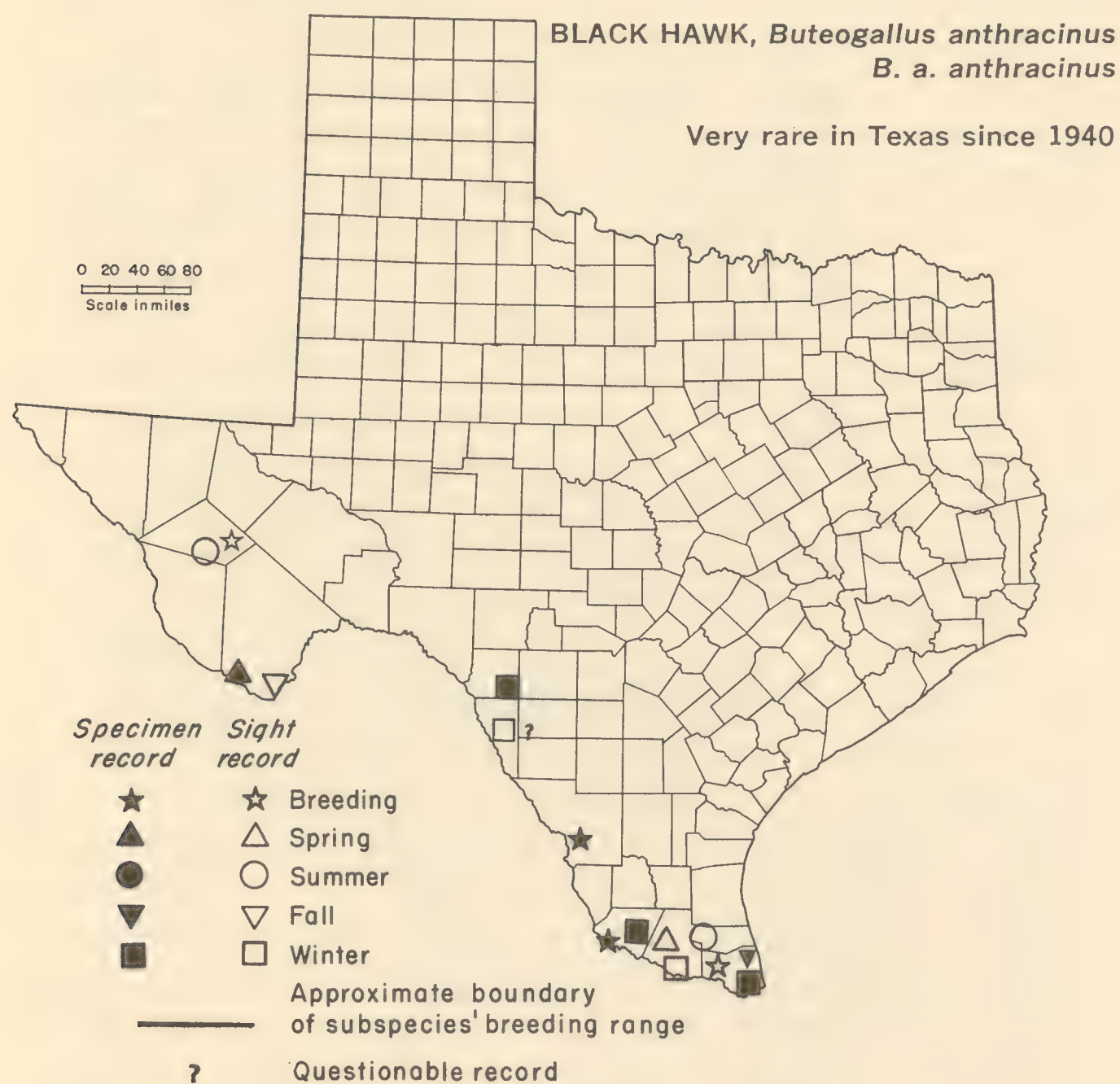
The Black Hawk utters hoarse loud whistles (usually during the nesting season), and a harsh, night heron-like *ka-a-a-a-ah ka-a-a-a-ah!*

CHANGES: Nesting populations of Black Hawks collapsed along the lower Rio Grande in the early years of the twentieth century; last recorded breeding was in Cameron County in May, 1937. In Tamaulipas, Texas' neighbor-state to the southwest, Black Hawks frequented sluggish rivers in apparently normal numbers until about 1958. In 1960, a pair of wintering Zone-tailed Hawks had displaced two formerly resident Mexican Black Hawks along the Río Corona near where Mexican Highway 101 crosses this river; this curious replacement was first pointed out by Maggie Schwartz, an exceptionally sharp identifier of black-colored hawks. The south Texas nesters probably were eliminated by cutting of timber along the Rio Grande; Tamaulipas birds seem to have been done in by runoff from DDT-ed cotton fields. The Jeff Davis County breeders are in relatively unpolluted ranch country; they may have been nesting for quite some time before their official discovery in 1970.

DETAILED ACCOUNT: ONE SUBSPECIES

MEXICAN BLACK HAWK, *Buteogallus anthracinus anthracinus* (Deppe)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear



from winter plumage. Entire upper parts dull black, fuscous black, or blackish mouse gray, wings more brownish, center of crown and of occiput with some white bases of feathers showing through; tail with narrow white tip and single broad white bar at about the middle; inner webs of secondaries and primaries basally rather imperfectly barred and mottled with russet and dark hair brown; outer primaries somewhat mottled with white on basal portion of inner webs; chin fuscous; remainder of lower parts chaetura black with slight greenish sheen, longest lower tail-coverts narrowly tipped with dull white; lining of wing fuscous to fuscous black; white spot at base of primaries below. Bill light plumbeous, dull black, or plumbeous black but lighter and more bluish basally, orange or pale yellow at extreme base; lores, cere, cutting edges of bill, and inside of mouth orange to bright yellow; orbital region dull yellow; iris hazel, reddish hazel, or dark brown; legs and feet straw yellow or wax yellow; claws bluish black or plumbeous black. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial*: Acquired by wear from first winter. Similar to first winter, but edgings narrower; buff markings paler. Cere, rictus, legs, and feet greenish yellow. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Upper parts dull black, head and hindneck broadly streaked with pinkish buff and cinnamon buff; tail dull black with numerous rather irregular bars of white and dull light buff and with a very narrow whitish tip; wings clove brown, lesser coverts and terminal portion of primaries blackish, primaries becoming white on inner webs, basally broadly barred with chaetura black, secondaries numerous barred on outer webs with fuscous black, clove brown, and hair brown, on inner webs with clove brown (or fuscous black), cinnamon, ochraceous cinnamon, and pale buff; wing-coverts edged and spotted with buffy white, light buff, cinnamon, and tawny; lower parts cinnamon buff, including lining of wings, the latter spotted; lower surface very broadly streaked; thighs broadly barred with dull black. Base of bill olive yellow to greenish yellow, tip plumbeous black; cere, rictus, and cutting edges of bill olive green, olive yellow, or yellowish green; iris brown; legs and feet dull greenish yellow; claws plumbeous black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Pale gray; head and breast whitish. Bill dark dull plumbeous; cere greenish yellow; iris brownish gray; legs and feet yellow; claws plumbeous black. *Natal*: Unknown.

MEASUREMENTS: *Adult male*: Wing, 337.1–400.0 (average, 365.0) mm.; tail, 195.1–222.0 (205.7); bill (culmen from cere), 24.4–28.9 (26.4); height of bill at base, 19.0–22.1 (20.3); tarsus, 75.9–95.0 (85.3); middle toe without claw, 39.9–47.0 (43.9). *Adult female*: Wing, 355.1–400.0 (380.5); tail, 197.1–247.9 (219.2); bill, 24.9–33.0 (28.4); height of bill, 19.0–21.6 (20.6); tarsus, 85.1–106.9 (91.7); middle toe, 38.1–48.5 (45.2).

RANGE: Trans-Pecos and lower Rio Grande (at least formerly) of Texas, south through mainland Mexico and Central America to n. Colombia (excluding birds from Utah, Arizona, New Mexico, and Sonora; also Pacific coast and islands from Chiapas to extreme n.w. Peru). In winter, withdraws from Trans-Pecos Texas.

TEXAS: *Breeding*: In addition to specific breeding records (see species account), one specimen collected near breeding range: Brewster Co., 2 mi. west of Castolon (May 9, 1935, G. M. Sutton). *Winter*: Seven specimens: Kinney Co., Fort Clark (Feb. 13, 1898, E. A. Mearns; U.S. Nat. Museum collection, no. 163726); Starr Co. (female, Feb. 13, 1898, D. B. Burrows; U.S. Nat. Museum collection, no. 126925); Cameron Co. (Oct. 23, 28, and Nov. 4, 1896, F. B. Armstrong; Jan. 9, 27, 1928, A. Brooks).

NESTING: *Nest*: In woodlands or fringes of timber along streams, even in marshes near coast; large bulky structure, sometimes 4 ft. in diameter; made of large sticks; bowl lined with bark and often green leaves. *Eggs*: 1–3, usually 1–2; short ovate, ovate, or oval; grayish white or greenish white; slightly spotted and irregularly blotched, mostly about larger end, with various shades of brown and with tawny olive; average size, 58.2 × 46.3 mm.

GOLDEN EAGLE, *Aquila chrysaëtos* (Linnaeus)

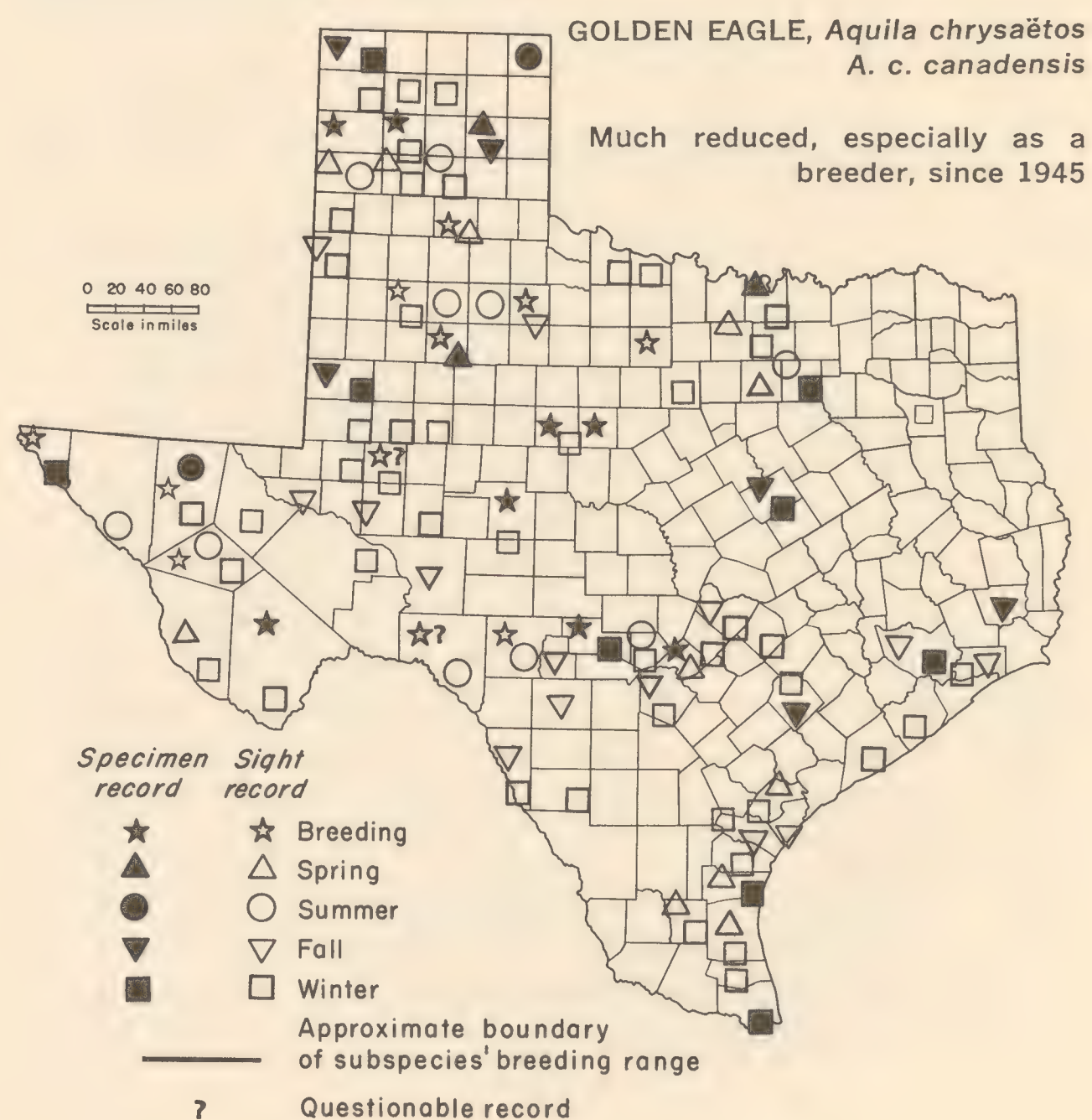
SPECIES ACCOUNT

See colorplate 7

An enormous hawk with heavy blackish beak; completely feathered tarsi. *Adult*: dark brown above and below with discreet golden or tawny tinge on crown and nape; vaguely grayish-mottled base of tail. *Immature*: often much darker, especially on crown and nape; in flight, reveals white flash at base of inner primaries, and basally white tail (terminal third with distinct blackish band), but these white areas highly variable as bird matures. Length, 33 in. (male), 36 (female); wingspan, 6¾ ft. (male), 7¼ (female); weight, 9½ lbs. (male), 10½ (female).

RANGE: Holarctic, in and near mountainous regions, south to Atlas, Caucasus, and Himalaya mountains, Korea, Japan, w. United States, Baja California, c. mainland Mexico, and Appalachians. Northern populations migratory.

TEXAS: (See map.) *Breeding*: Early Feb. to Nov. (eggs, Feb. 16 to Oct. 11) from 900 (at least formerly) to 8,700 ft. Scarce and local in northern Panhandle and Trans-Pecos; rare and local in middle and southern Panhandle. Recent successful nesting in Guadalupe (1960's) and Chisos (1970, not fully confirmed) mts., and in Briscoe and Garza cos. (1950's). Has bred (chiefly during 19th century) on and just north of Edwards Plateau; last available conclusive record: Edwards Co., along Hackberry Creek 12 mi. south of Rocksprings (nest found and parents observed, July 13, 1902, Vernon Bailey). One summer record outside of breeding range: Dallas Co., near Dallas (1 resting in field with 11 Ospreys, June 25, 1960, C. E. Kiblinger and Hazel Nichols). *Winter*: Early Oct. to mid-Mar. (extremes: Aug. 28, Apr. 29). Fairly common locally



to scarce west of 100th meridian; scarce to rare eastward to Sherman, Dallas, Waco, Bastrop, Lavaca Co., and on central and lower coasts; very rare on and near upper coast.

HAUNTS AND HABITS: The majestic Golden Eagle—so named for its golden nape feathers—seeks wild expanses of open country, whether of mountains, plains, or canyons. It is the most widespread species of *Aquila* and the only member of the genus found in North America. In the United States this eagle has probably suffered more from direct persecution—poisoning, shooting, and trapping—than from habitat destruction. After all, even in this modern day it is still a bit difficult to bulldoze all the Rocky Mountains flat! Thus in Texas, its range in the rugged western sections appears unchanged, but its numbers—never abundant—are noticeably diminishing. This hawk is usually seen singly or in pairs; in winter, when small game is scarce, several hungry eagles may cooperate to take larger-than-ordinary prey.

On the wing, the Golden flaps between graceful glides on flat wings; at times it soars in ever-rising spirals until it is lost from view. A hunting bird sweeps rather low over the terrain; when prey is sighted, it swoops down swiftly to take it in its massive talons. A Golden Eagle chiefly assails rabbits, jackrabbits, hares, ground squirrels, young antelope and deer, various birds, and snakes. Occasionally it may attack larger prey, such as a full-grown deer, but this is usually a weak or handicapped individual. The bird's presence at a large carcass is by no means proof that it killed the animal, since the Golden Eagle eats carrion as well as freshly killed meat.

This hawk apparently is unable to lift more than half its own weight from the ground, or a limit of about five to six pounds. Heavy prey—anything over two pounds—is best carried when the bird can take off from a slope or cliff ledge into rising air currents. When lifting from the ground, it must spring with both feet; at such times, any additional bulk in its talons presents obvious difficulties. A pair of eagles maintains a breeding and foraging territory in size from twenty to sixty square miles. No other Golden Eagles may intrude, and, in times of food shortage, other competitors, chiefly Red-tailed Hawks and Great Horned Owls, are eliminated. The Golden Eagle is a rather sedentary species; however, young birds—and some adults—stray widely during the postnesting season, and northern individuals retreat southward in winter to less frozen feeding grounds.

Calls include a barking *kya* and long, sibilant, whistling notes; however, Golden Eagles are seldom vocal.

CHANGES: Healthy populations of two great eagles formerly divided temperate North America between each other. The Bald Eagle inhabited shores and the Golden ranged mountains. Since the coasts were civilized first, the Bald began declining noticeably in the nineteenth century; the Golden's western mountains and rangeland were not greatly disturbed until the twentieth century.

Especially since 1930, many Texas ranchers have waged unrelenting war against eagles—chiefly, but not exclusively, Goldens. Nests have been broken up and adults and immatures have been slaughtered with guns, poisoned baits, and traps. Sheep raisers in the Trans-Pecos have hired several airplane pilots to pursue flying eagles. The procedure is to fly up beside the big bird and blast it out of the air with a shotgun. From the 1930's into the early 1960's, motorists anywhere in the western half of Texas frequently encountered one or more very, very dead Goldens—sometimes with a few Bald Eagles mixed in—spread-eagled on roadside fences. Dr. Walter R. Spofford, in the course of his Trans-Pecos eagle study (February and March, 1963), flew with a pilot who said he usually shot four hundred eagles each winter, and other aviators in the same region as a rule blasted down from three hundred to four hundred more. At Marfa, Texas, Spofford examined eight dead eagles shot on one ranch from a truck—the usual method of obtaining roadside displays since airborne eagle-gunners generally do not retrieve their kills. Nowadays (early 1970's), one seldom sees these grisly scarecrows—the ranchers usually bury or burn those corpses they pick up.

The senior editor sincerely wishes that eagles ate as many lambs and kids as sheep and goat growers claim they do. In a subhumid climate, such as covers most of Texas, sheep convert grasslands to blowing sand deserts and goats transform brushwood mountains and hills into bare rock.

A few places in Texas offer protection for the Golden Eagle (except, of course, from pesticide residues which are everywhere). One is the 1,100-square-mile Big Bend National Park. It is big enough to accommodate three summering pairs which were still present in 1970. Then there are some cattle ranchers who realize that a cow, or even a calf, is a bit too heavy for even a great eagle to carry off! The large majority of Golden Eagles seen in Texas are hatched in Canada where poisons and persecutions are somewhat less.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN GOLDEN EAGLE, *Aquila chrysaëtos canadensis* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper and lower parts, including lining of wing, clove brown mixed with olive brown, fuscous black, and fuscous; wing-quills dull black; scapulars sometimes with a little white; hind-head, also sides and back of nape, with pointed fuscous feathers having dull light buff, dull ochraceous tawny, and dull russet edgings; anterior lesser wing-coverts buffy white or dull buff; tail clove brown or brownish black, middle portion with one or two imperfect mottled bars of hair brown, brownish hair brown, or neutral gray, drab, or light drab; wing-quills dull black or brownish black, inclining to fuscous on inner margins, inner webs basally more or less mottled with drab or dull white; edge of wing mottled more or less with dull buff or dull cinnamon; fully feathered tarsus more or less mottled or clouded with dull cinnamon, dull clay color, and dull cinnamon buff mixed with sepia and warm sepia; crissum fuscous or buffy brown. Bill dull brownish or blackish slate color; cere and corner of mouth pale yellow, wax yellow, or greenish yellow; iris of male reddish brown to brownish orange or dull

yellow, of female dark brown; feet chrome yellow or greenish yellow; claws grayish black. *Adults, winter*: Acquired by incomplete postnuptial molt. Similar to nuptial adults. *Third nuptial*: Acquired by wear from third winter. Similar to nuptial adults, but inner primaries and secondaries with some white at base; anterior lesser wing-coverts darker; tail feathers with extreme base white. *Third winter*: Acquired by partial postnuptial molt. Like third nuptial. *Second nuptial*: Acquired by wear from second winter. Similar to third nuptial but with more white at base of tail and at base of inner primaries and secondaries. *Second winter*: Acquired by partial postnuptial molt. Similar to second nuptial. *First nuptial*: Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Similar to nuptial adults but decidedly darker, crown and back of neck decidedly duller and darker with less golden brown tinge; anterior lesser wing-coverts dark brown; basal half or two-thirds of tail white, more or less mixed with dark brown, therefore, black terminal portion narrower; tarsus rather paler than in adult, sometimes mixed with dull white. Bill dull black, brownish black, or blue-black, but base olive buff, cutting edges and spot at base of maxilla and one on mandible deep chrome; cere deep chrome; iris mars brown or hazel; toes deep chrome; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Pure white. *Natal*: Creamy white or yellowish white, tips of feathers light gray. Bill black; cere dull yellow; iris dark brown; feet flesh color or yellowish; claws black.

MEASUREMENTS: *Adult male*: Wing, 555.0–610.1 (average, 580.7) mm.; tail, 320.0–359.9 (337.3); bill (culmen from cere), 37.1–40.9 (39.6); height of bill at base, 29.9–33.0 (31.8); tarsus, 101.1–121.9 (111.8); middle toe without claw, 56.9–66.0 (60.5). *Adult female*: Wing, 620.0–666.0 (633.2); tail, 350.0–390.1 (366.3); bill, 40.9–47.0 (43.9); height of bill, 31.5–35.1 (33.3); tarsus, 103.1–123.0 (114.8); middle toe, 62.0–72.9 (67.6).

RANGE: Locally from n. Alaska, Mackenzie, Keewatin (probably), n. Manitoba, and Labrador, south to n. Baja California, Sonora, Durango, Nuevo León, w. Texas, and w. South Dakota; rarely in most remote areas of Appalachian Mts. Winters south to s. Texas, Guanajuato, Hidalgo, and n. Florida.

TEXAS: *Breeding*: Collected north to Oldham (eggs) and Potter (eggs), east to Callahan (eggs), south to Comal (eggs) and Kerr, west to Brewster and Culberson cos. *Winter*: Taken north to Dallam and Cooke (Mar. 9), east to Dallas, McLennan, and Hardin (Nov. 1), south to Cameron, west to El Paso cos.

NESTING: *Nest*: In mountains, broken or open country, usually on hill or high bank of stream, sometimes in forest, or near a lake shore, on a cliff, or in a tree; large bowl, rather flat on top; made of large sticks, brush, grass, weeds, and other rubbish; well lined with weeds, roots, small twigs, straw, green leaves, bark, pine needles, animal hair, and feathers. *Eggs*: 1–4, usually 2–3, short ovate to ovate or oval to elliptical oval; dull white or cream color; occasionally unspotted; usually spotted and blotched with various shades of brown, and with shell markings of gray or lilac; average size, 74.4 × 58.9 mm.

BALD EAGLE, *Haliaeetus leucocephalus* (Linnaeus)

SPECIES ACCOUNT

See colorplate 8

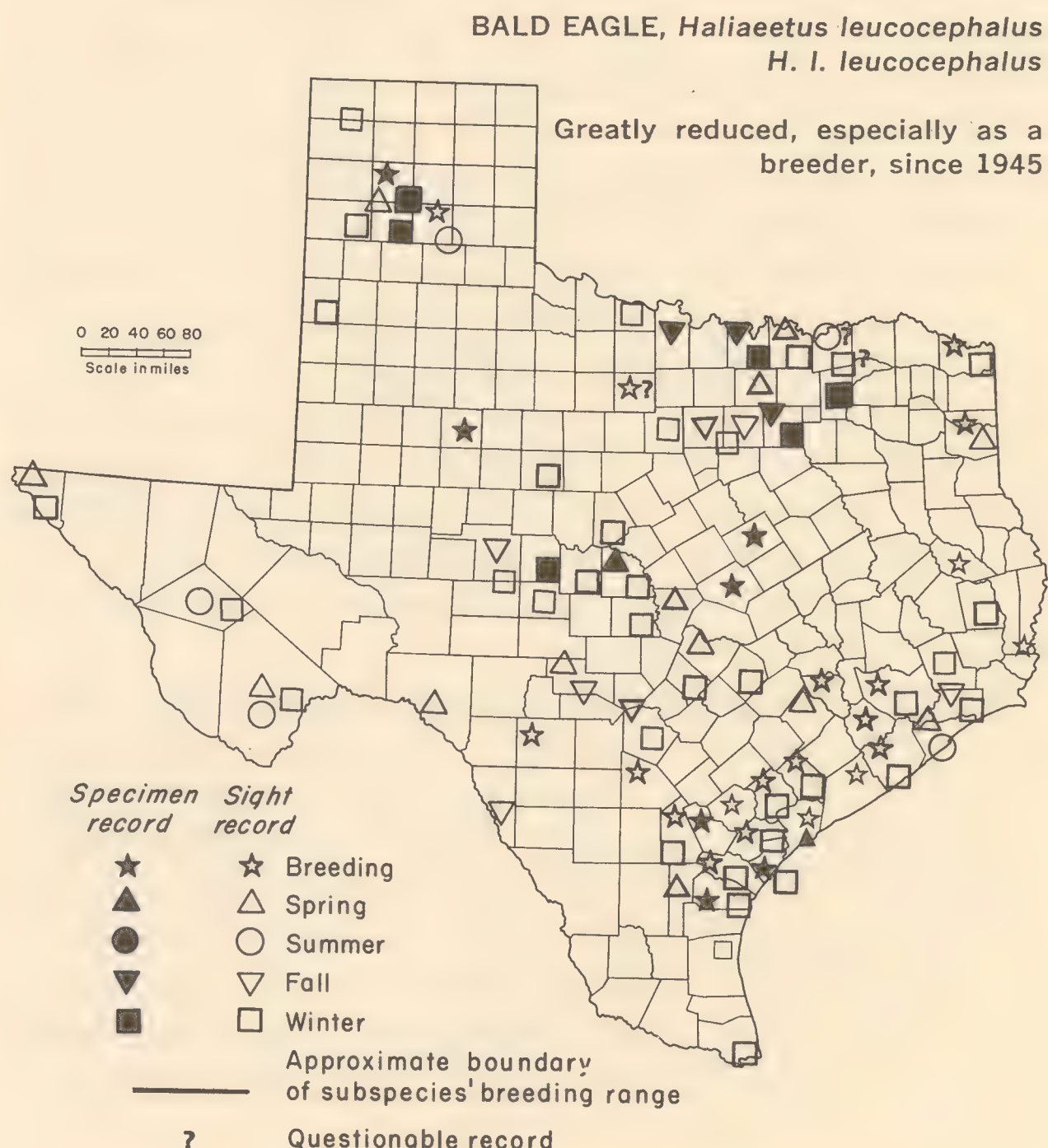
A huge hawk with very heavy, yellow (adult) beak; yellowish unfeathered tarsi and toes. *Adult*: dark brown above and below with snowy white head and tail. *Immature*: more or less dusky (including head and tail) with variable mottlings of buff and white; brownish beak; in flight, resembles young Golden Eagle but lacks sharply defined white patches on primaries and tail. Length, 33 in. (male), 36 (female);

wingspan, 6¾ ft. (male), 7¼ (female); weight, 8½ lbs. (male), 11 (female).

RANGE: Extreme n.e. Siberia, n. Alaska, Mackenzie, n.e. Manitoba, and Labrador, south to Baja California, Texas, Gulf states, and Florida. Very much reduced over most of its range; still occurs commonly in coastal Alaska and n. British Columbia and, in lesser numbers, in Florida.

TEXAS: (See map.) *Breeding*: Late Oct. to early May—very occasionally at least into July (eggs, Nov. 6 to June 20; young ready to fly as early as Mar. 1; young in nest as late as June 17) from near sea level to about 3,700 ft. Scarce and local on and near central coast; rare and local in southeastern portion of state, including upper coast; has nested in northern Panhandle. At least 4 successful nestings as late as 1971: 1 in Orange, 2 in Brazoria, and 1 in Aransas cos. (D. N. Russell). Formerly bred more frequently and extensively through present range; also bred north along eastern boundary to Red River, in central portions, and in southern Panhandle. *Winter*: Early Oct. to late Mar. (extremes: Aug. 6, Apr. 30). Uncommon to scarce in northern Panhandle and near Red River boundary; scarce (nonbreeders) to rare near upper and central coasts; rare and highly irregular elsewhere in eastern three-quarters; very rare in Trans-Pecos.

HAUNTS AND HABITS: The Bald Eagle is nowadays exceedingly rare throughout most of the United States—a particularly gloomy and ironic omen, considering it is this country's national emblem. A member of *Haliaeetus*, whose species are fish eagles and sea eagles, it—like its relatives—seeks seacoasts, estuaries, wide rivers, and large lakes. Water must be clear, fishing good, and tall trees or cliff ledges available for its repeatedly used, often gigantic, nest platform. Typically,



this bird of sea and lake shore leaves more rugged mountain terrain to the Golden Eagle. The Bald is usually seen singly or with its mate—pairs apparently form lifetime bonds; however, during winter in cold regions, several birds may gather at good fishing waters. This species is essentially nonmigratory, although some northern individuals move a bit south in fall, and southern postbreeders wander north, sometimes as far as Canada.

In pursuit of fish or other prey, the ordinarily somewhat labored, slow flight of the Bald Eagle transforms to a swifter, more graceful display. At times it soars high on flat wings like a Golden Eagle, and often descends in a rapid dive on half-closed wings. A Bald Eagle commonly perches, often for a prolonged period, in a tree on a dead limb overhanging water. When a fish swims near the surface, the bird swoops down and grasps it in its talons. On most sweeps, the eagle barely gets its feet wet; it submerges on occasion, but never consistently like an Osprey.

Bald Eagles also trail seabirds to schools of fish; they are noted, as well, for pirating Ospreys—forcing them to release or disgorge their catch. Food of manageable size is eaten on the wing or carried to a feeding perch. To take heavy prey, such as a cormorant or Canada Goose, the Bald Eagle often drops into the water with its victim and tows it to shore. Fifty percent or more of its diet is fish; but, especially in winter, ducks, coots, other birds, rabbits, and rodents are taken. Carrion (post-spawning salmon, pesticated or otherwise killed fish, lead-shot-poisoned ducks, etc.) is an additional and important mainstay.

During the nonbreeding season, the Bald Eagle is rather silent. Usually about the aerie, it sounds a squeaky, gasping *ke ke ke ke ker* or *kweek kik ik ik ik ik ik*; also, a loud, low-keyed *kak kak kak kak*. Neither vocalization, however, is commensurate with this bird's size or majesty.

CHANGES: Away back in 1782 there was a contest to select a national emblem for the newly created nation along the Atlantic seaboard. Benjamin Franklin spoke for the Wild Turkey, but the Bald Eagle won—and ever since that year Americans have been doing their best to exterminate both winner and runner-up.

By 1940, numerous states had active projects going for the restoration of Wild Turkeys, even though bulldozers were increasingly destroying habitat; that same year saw passage of a federal law giving "complete protection" to the Bald Eagle. However, eagle decline was not arrested by legislation. Ranchers, hunters, and fishermen continued to shoot, trap, and poison the national emblem as before.

During the 1950's, public sentiment at last began to turn in favor of preserving a few living eagles. Unfortunately at this same time heavy concentrations of DDT, dieldrin, heptachlor, and other stable, hellish compounds began piling up in soil and water, especially coastal water. The soaring 1960's as they were called, were primarily noteworthy for their soaring pollution. Except in Alaska, where salmon still died mostly from

spawning, fish-eating Bald Eagles were laying cracking—or even shell-less—eggs by 1970.

In 1971, six miracles occurred in Texas: Six young Bald Eagles flew from four nests. According to Dennis N. Russell, Texas Parks and Wildlife biologist assigned to study endangered species, these eagles and their parents were able to accomplish this feat because they avoided fish. Instead they ate rabbits, teal, and gallinules—all primarily herbivorous creatures which ingest and store in their body fat less pesticide than do most fish. Interested Texans should not expect miracles to continue—even rabbit flesh will probably become highly polluted in a few years.

Nowadays (1971), the only place in the state where a bird watcher can be sure of seeing any sort of Bald Eagle is in the middle of Falcon Dam on the Texas-Tamaulipas boundary. Here, where Anglo-America and Latin America meet, is a monument. Two metal columns stand side by side. Near the base of the U.S. column, a Bald Eagle is affixed to the great seal of its country; inches away, on the other column, a Mexican Caracara perches within its great seal. As living birds, there are many more Caracaras in Mexico than there are Bald Eagles in the United States. But the former species is declining, too. American-made poisons and bulldozers pollute the world.

DETAILED ACCOUNT: TWO SUBSPECIES

SOUTHERN BALD EAGLE, *Haliaeetus leucocephalus leucocephalus* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Head, upper part of neck all around, entire tail, and upper and lower tail-coverts white; remainder of upper parts, including wings, clove brown, fuscous black, or dull black, feathers more or less edged or mixed with olive brown and fuscous; lower parts, including lining of wing, clove brown to fuscous, feather edges lighter; posterior under wing-coverts hair brown. Bill and cere deep chrome yellow, deep dull cadmium, or wax yellow; eyebrow, orbits, gape, and corner of mouth deep dull cadmium or light chrome yellow; feet and tarsi deep chrome yellow or deep dull cadmium; claws black; iris Naples yellow, yellowish white, pale chrome yellow, yellowish gray, or even light red. *Adults, winter:* Acquired by complete postnuptial molt from ninth nuptial. Similar to nuptial adults. *Ninth nuptial:* Acquired by wear from ninth winter. Similar to nuptial adults (tenth nuptial plumage), but tail with at least a few slight brownish markings on some feathers, usually at base or tip. *Ninth winter:* Acquired by complete postnuptial molt from eighth nuptial. Like ninth nuptial. *Eighth nuptial:* Acquired by wear from eighth winter. Similar to ninth nuptial, but tail with more evident fine dark brown markings. *Eighth winter:* Acquired by complete postnuptial molt from seventh winter. Similar to eighth nuptial, but tail with a few more dark brown markings which are also more conspicuous. *Seventh winter:* Acquired by complete postnuptial molt from sixth nuptial. Like seventh nuptial. *Sixth nuptial:* Acquired by wear from sixth winter. Similar to seventh nuptial, but upper and lower tail-coverts, although white, are marked with dark brown; tail, although largely white, is dull light brownish gray terminally and marked a little more noticeably with dark brown basally. *Sixth winter:* Acquired by complete postnuptial molt from fifth nuptial. Like sixth nuptial. *Fifth nuptial:* Acquired by wear from fifth winter. Similar to sixth nuptial, but tail, although mostly white, with larger and more numerous dark brown markings, chiefly on terminal and basal portions of feathers. *Fifth winter:* Acquired by complete postnuptial molt from fourth nuptial. Like fifth nup-

tial. *Fourth nuptial*: Acquired by wear from fourth winter. Resembling fifth nuptial, but head and neck mostly dull white, somewhat blotched or otherwise marked with dark brown; tail much more heavily blotched and spotted with dark brown, a few rectrices being almost wholly this color. Bill light olive, a little tinged with yellow; iris light brown. *Fourth winter*: Acquired by complete postnuptial molt from third nuptial. Like fourth nuptial. *Third nuptial*: Acquired by wear from third winter. Similar to fourth nuptial, but head and neck dark brown, streaked with white; tail mostly dark brown with some light gray areas on inner webs of feathers; upper and lower tail-coverts more mottled with dark brown. Bill greenish black; iris dark brown. *Third winter*: Acquired by complete postnuptial molt from second nuptial. Like third nuptial. *Second nuptial*: Acquired by wear from second winter. Similar to third nuptial but paler, upper parts and breast more mixed with whitish feathers; head and neck dark brown. *Second winter*: Acquired by complete postnuptial molt from first nuptial. Similar to second nuptial. *First nuptial*: Acquired by wear from first winter, with which it is identical. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to second nuptial, but tail, exposed surface of wings, inner webs of wing-quills, and thighs more or less marked or mottled with pale brown or brownish white. Maxilla chaetura black or brownish black, mottled with dull cream color; mandible brownish cream color, rami and cere dull naples yellow mottled with drab; iris tawny olive or pale yellowish gray; legs and feet maize yellow or lemon yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Upper and lower surfaces hair brown or buffy brown to drab, in places lighter. *Natal*: Pale yellowish white or smoke gray; head and lower parts paler; throat dull white.

MEASUREMENTS: *Adult male*: Wing, 505.0-549.9 (average, 530.4) mm.; tail, 231.9-290.1 (270.5); bill (culmen from cere), 47.0-52.1 (49.0); height of bill at base, 30.5-32.0 (31.2); tarsus, 86.1-97.1 (91.7); middle toe without claw, 59.9-63.0 (61.5). *Adult female*: Wing, 549.9-588.0 (569.0); tail, 269.0-340.1 (294.6); bill, 49.0-55.1 (53.1); height of bill, 29.9-35.1 (32.8); tarsus, 95.0-106.9 (101.1); middle toe, 66.0-77.0 (71.7).

RANGE: C. California, south to s. Baja California (both coasts), s. Arizona, Texas, Gulf states, n. South Carolina, and Florida. Winters throughout breeding range; southern postbreeders, chiefly from Florida, wander north to Virginia, n. Illinois, Michigan, New England states, and s.e. Canada.

TEXAS: *Breeding*: Eggs collected in following counties: Potter (1916, E. W. Gates), Scurry (June 20, 1890, H. Smissen), McLennan (Jan., 1900, J. J. Carroll), Bell (Dec., 1897, Carroll), Aransas (Nov. 20, 1885, J. M. Priour), and Nueces (Feb. 26, 1884, and Jan. 5, 1886, B. F. Goss). Immature specimens: Bee Co., Aransas River (Apr. 15, 1886, and Apr. 21, 1887, Priour). (See species account.) *Winter*: Taken in Clay (Sept. 29), Cooke, Dallas, Calhoun (ca. Mar. 15), and Concho cos.

NESTING: *Nest*: In wooded areas, near sea, large stream, or other large body of water, in mountains or on other rocky ground; in tree, on cliff, or on ground; huge mass (up to nearly 2 tons) more or less flat at top, built of large and small sticks and various kinds of rubbish; lined with moss, roots, grass, and seaweeds. *Eggs*: 1-4, usually 2; rounded ovate to ovate; white or ivory white; usually unmarked, but sometimes spotted with light buffy brown, sometimes much nest stained; average size, 70.6 × 54.3 mm.

NORTHERN BALD EAGLE, *Haliaeetus leucocephalus washingtoniensis* (Audubon)

Haliaeetus leucocephalus alascanus of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Similar to *H. l. leucocephalus* but larger, particularly wing and bill.

MEASUREMENTS: *Adult male*: Wing, 570.0-606.1 (average, 586.2) mm.; tail, 263.9-350.0 (312.4); bill (culmen from cere), 47.0-56.9 (51.8); height of bill at base, 32.5-35.6 (33.8); tarsus, 84.1-105.9 (96.3); middle toe without claw, 67.1-73.9

(70.4). *Adult female*: Wing, 575.1-685.8 (627.4); tail, 285.0-390.1 (339.9); bill, 47.0-58.9 (55.6); height of bill, 35.1-38.1 (36.3); tarsus, 83.1-120.9 (97.8); middle toe, 68.0-82.0 (74.9).

RANGE: N.e. Siberia (Chukotski Peninsula and Bering Island), n. Alaska, c. Mackenzie, n.e. Manitoba, and Labrador, south to Oregon, n. Colorado, Pennsylvania, and North Carolina. Winters chiefly from s.e. Alaska, s. Mackenzie, Minnesota, s. Ontario, and s. Nova Scotia to Texas, and probably Louisiana, Georgia, and Florida.

TEXAS: *Winter*: Six collections: Potter Co., near Amarillo (ca. 1896; R. L. More collection); Randall Co., near Canyon (3 taken, 1 each winter between 1934 and 1937, L. G. Simms); Cooke Co., Gainesville (found dead, Nov. 2, 1878, G. H. Ragsdale); Refugio Co. (female, prior to 1903; Baylor University collection).

MARSH HAWK, *Circus cyaneus* (Linnaeus)

SPECIES ACCOUNT

See colorplate 9

Hen Harrier of Old World authors. A long-winged, long-bodied hawk with owl-like facial discs. Both sexes have conspicuous white rump-patch; long tail with several blackish bars. *Male*: gray above; pale gray chest; lightly cinnamon-flecked white on remaining under parts; in flight, reveals black-tipped wings. *Female*: cinnamon-streaked dark brown above; heavily brownish-streaked buffy white below. *Immature*: resembles female above; rich russet below with narrow brown streaks confined to chest. Length, 18¼ in. (male), 20½ (female); wingspan, 3½ ft. (male), 4 (female); weight, ¾ lb. (male), 1¼ (female).

RANGE: N. North America and Eurasia (west of Kolyma River), south to n. Baja California, Texas, Virginia, Portugal, the Pyrenees, Carpathian, and Caucasus mountains, n. Tibet, and Manchuria. Winters chiefly from middle breeding range to n. South America, West Indies, Mediterranean region, Iran, India, and Japan.

TEXAS: (See map.) *Breeding*: Apr. to late July (eggs, Apr. 20 to May 30) from near sea level to 4,500 ft., possibly higher. Rare and local in Trans-Pecos and on central and upper coasts. Recent breeding records: Harris Co., field in s.e. Houston (nest from which 4 birds fledged, June, 1973, Mike Braun, et al.); Galveston Co., near Hitchcock (nest with eggs observed, Apr. 7, 1971, T. B. Feltner). Apparently bred formerly at Austin (fide C. D. Oldright). Summers locally in northern Panhandle (nesting likely) and in middle and southern Panhandle (irregular nesting suspected along westernmost tier of counties), but actual breeding evidence lacking. Has summered near San Antonio (fide H. P. Attwater and A. J. Kirn). One mid-summer record for lower coast: Cameron Co., Laguna San Martín (1 female, July 7, 1940, L. I. Davis). *Winter*: Early Sept. to late Apr.—a few to mid-May (extremes: Aug. 9, June 9). Very common to uncommon virtually throughout.

HAUNTS AND HABITS: The Marsh Hawk, which ranges many parts of the Northern Hemisphere, is usually observed cruising low, in tireless harrier fashion, over marshes, sand dunes, tidal flats, wet or dry fields and pastures, meadows, and prairies. During the cold

months, northern birds generally move to milder climates. Although seen singly or in pairs at most seasons, Marsh Hawks often travel in small loose flocks during migration, especially in autumn.

Migrants fly high over mountains and plains, but hunters skim low, usually three to thirty feet, over the ground. A foraging Marsh Hawk is graceful, buoyant, and unhurried; tilting from side to side, it glides at intervals with wings in a slight dihedral. When it sights prey—usually a mouse or rat—the bird may hover briefly or immediately drop to seize it. The catch is either eaten on the spot or carried to a repeatedly used feeding plot which is littered with pellets and feathers of previous meals. Additional food includes frogs and small snakes; various prairie, marsh, and shore birds; also grasshoppers, locusts, crickets, and other insects. The Marsh Hawk seldom resorts to trees; instead it nests and roosts on the ground. It generally returns night after night to the same place—usually in the middle of a large open field or pasture. During the nonbreeding season, it often roosts in groups and sometimes shares quarters with Short-eared Owls.

A high-pitched *ke ke ke ke ke* is the standard cry of a male Marsh Hawk; the female utters a similar but weaker, more compressed *pepepepepepe*. His alarm call is *cha cha cha cha*; hers, *kee kee kee kee kee kee*. *Kek* notes are sounded around the nest.

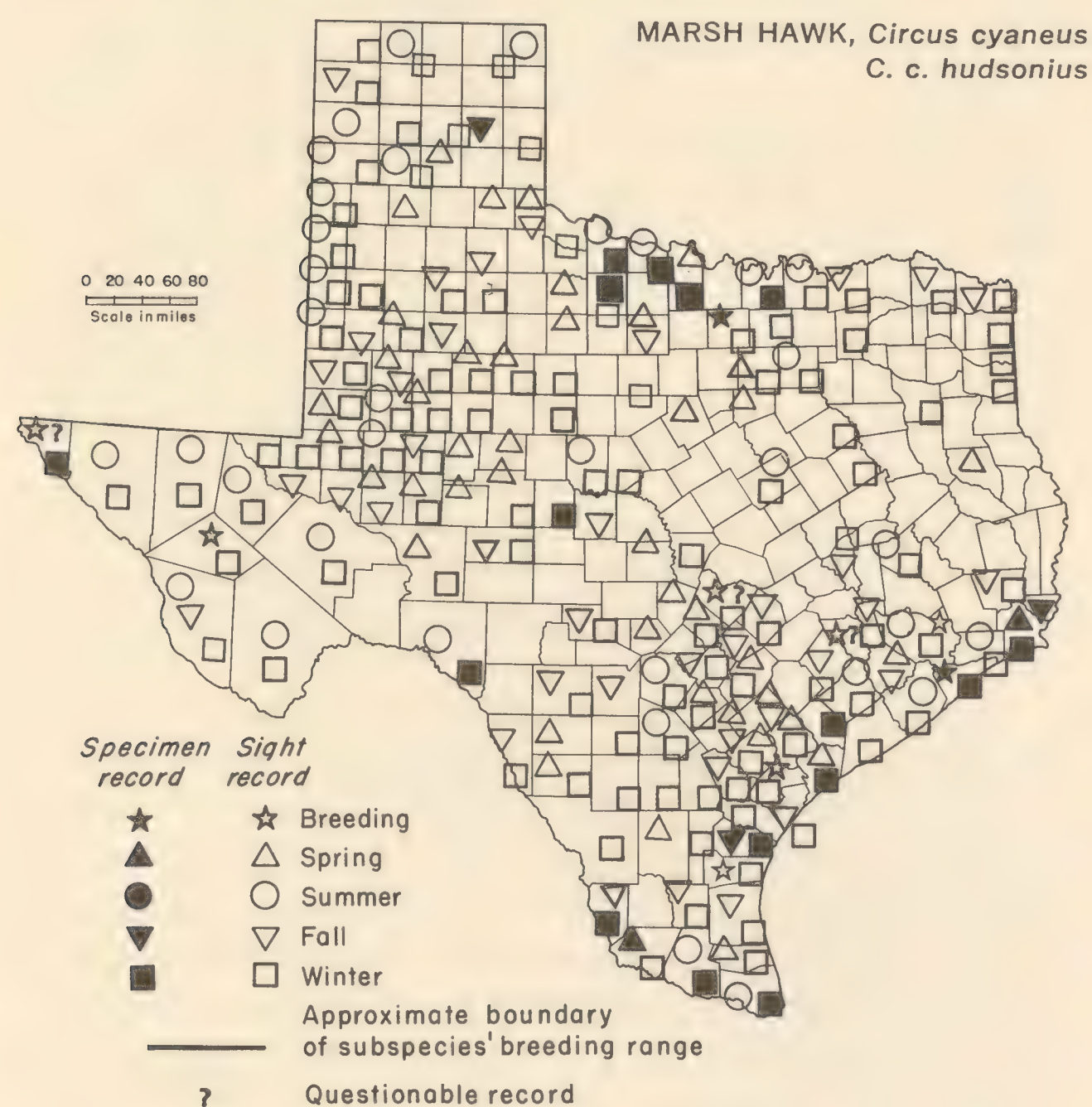
CHANGES: It is the senior editor's distinct impression, based on over forty years' observation in Texas, that the Marsh Hawk is slowly sinking. However, this decline is too subtle to show in Audubon Christmas Bird Counts. As late as the Christmas season of 1971, the high count in the nation for *Circus cyaneus* was 156 obtained at Freeport, in the notoriously polluted Houston region. Even more remarkable, at least one pair nested in 1971 near Hitchcock, Galveston County,

which is in this same highly poisoned area. The Marsh Hawk has some factors in its favor. It has a wide breeding range in parts of Canada and Alaska that are relatively uncivilized and, therefore, little polluted. Unlike most hawks, it has no use for trees. In the past twenty-five years, millions of acres of Texas rangeland have been rendered treeless by bulldozers and root-plows. This operation, at least in theory, improves habitat for cattle and, incidentally, for Marsh Hawks. It may be that population loss of this harrier due to pesticides and excessive building of houses and roads is nearly offset by man's creation of more foraging space for the bird in its winter range. In addition, the Marsh Hawk eats mostly herbivorous and graminivorous animals which contain relatively low levels of DDT, etc., as compared to fish and crustaceans.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN MARSH HAWK, *Circus cyaneus hudsonius* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts, including exposed surface of closed wings and tail, brownish neutral gray to mouse gray, feathers with darker centers or shaft streaks, center of crown, back, and scapulars darker, often becoming fuscous or even fuscous black, hindneck with a few streaks of tawny or buff, upper tail-coverts white; inner webs of tail feathers white or grayish white, except terminally, tinged with buff or cinnamon and crossed by several rather irregular bars of fuscous black or fuscous; tips of primaries fuscous black, basal portion of inner webs and of secondaries white, crossed with bars of fuscous or clove brown; anterior lower parts neutral gray or between light mouse gray and smoke gray; remainder of lower parts white, spotted or irregularly barred with cinnamon or light cinnamon; lining of wing white with a few irregular bars of neutral gray; axillars white barred with neutral gray and cinnamon. Maxilla and tip of mandible bluish black or brownish black, rest of mandible and basal cutting edges of maxilla cinereous; inside of mouth plumbeous or purplish pink; edge of eyelid gamboge yellow; cere canary yellow, gamboge yellow, or greenish yellow; iris gamboge yellow; legs and feet bright yellow, deep cadmium, or yellowish deep chrome; claws black. *Adult male, winter:* Acquired by complete postnuptial molt. Same as nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Upper parts between olive brown and fuscous, crown and back of neck narrowly streaked with cinnamon buff, cinnamon, and white, feathers of rump narrowly and obscurely edged with dull russet, upper tail-coverts buffy white, scapulars with large spots of tawny, russet, cinnamon, and cinnamon buff; tail dull olive brown, two middle feathers plain, remainder broadly barred with hair brown and cinnamon, pinkish buff, and pale pinkish buff, becoming white or buffy white near shafts of feathers basally; wing-quills fuscous or fuscous black, outer edges of primaries and of secondaries hair brown on outer feathers, primaries with broad white or buffy white bars except on terminal portion; outer and middle secondaries with similar bars of pinkish buff or pale cinnamon buff; wing-quills like back, anterior lesser coverts much mixed with tawny, others broadly spotted and edged with tawny, russet, cinnamon, cinnamon buff, and pale buff; lower surface dull white or buffy white, throat and jugulum broadly streaked with dull olive brown, sides broadly streaked, abdomen narrowly so, with dull ochraceous tawny or cinnamon, crissum with a few spots or narrow streaks of same color; lining of wing light buff with bars and spots of hair brown, cinnamon, and fuscous, outer portion scarcely spotted. Bill black, but base cinereous; cere canary yellow, dull light green, or sulphur yellow; iris canary yellow, pale grayish brown, vandyke brown, or walnut brown; legs and feet chrome yellow,



pale lemon yellow, or naples yellow; claws black. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male, second nuptial*: Acquired by wear from second winter. Similar to nuptial adult male, but upper parts decidedly darker; lower surface with considerable amount of white, mottled with buff and drab, jugulum suffused with drab. *Male, second winter*: Acquired by complete postnuptial molt. Like second nuptial. *Female, second nuptial*: Acquired by wear from second winter. Similar to nuptial adult female but darker; numerous feathers of upper parts edged with rufous. *Female, second winter*: Acquired by complete postnuptial molt. Like second nuptial female. *Male and female, first nuptial*: Acquired by wear from first winter, with which it is identical. *Male and female, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Upper surface between clove brown and olive brown; head narrowly, nape broadly, streaked with tawny and russet; scapulars with large spots of light russet or cinnamon; upper tail-coverts creamy white; wings and tail fuscous or fuscous black; middle tail feathers with several broad bars of hair brown, remaining feathers with similar bars of tawny, russet, and orange cinnamon; lining of wing cinnamon buff, inner and posterior coverts streaked with fuscous or hair brown; most of lower parts tawny, jugulum narrowly streaked with clove brown, posterior lower parts cinnamon. Bill deep black, plumbeous basally; cere and corner of mouth yellowish olive or greenish yellow; iris yellowish gray or dark brown; legs and feet orange-yellow or chrome yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Upper parts pinkish cinnamon or pale cinnamon buff; lower parts pale pinkish cinnamon, becoming

pinkish cinnamon on jugulum. *Natal*: White, upper parts slightly tinged with buff.

MEASUREMENTS: *Adult male*: Wing, 327.7–351.8 (average, 339.9) mm.; tail, 228.9–251.5 (241.6); bill (culmen from cere), 15.0–17.5 (16.3); height of bill at base, 15.0–17.0 (16.3); tarsus, 69.3–73.4 (72.7); middle toe without claw, 29.9–34.0 (32.0). *Adult female*: Wing, 335.0–405.1 (367.5); tail, 223.0–265.9 (249.5); bill, 17.5–19.0 (18.5); height of bill, 16.0–18.0 (17.5); tarsus, 71.9–84.1 (79.5); middle toe, 31.0–38.6 (34.5).

RANGE: N.w. Alaska to n. Manitoba and Newfoundland, south to n. Baja California, New Mexico, Texas, Missouri, and Virginia. Winters chiefly from s. British Columbia, e. North Dakota, s. Ontario, and New York through Mexico and Central America to Colombia; also Bermuda and West Indies.

TEXAS: *Breeding*: Specimens: Wise Co., Decatur (eggs taken, Apr. 20, 1889, J. A. McDonald); Galveston Co., Galveston (nest with 4 eggs collected, Apr. 29, 1837, J. J. Audubon). (See species account.) *Winter*: Taken north to Gray (Nov. 17), east to Cooke and Orange (Nov. 14), south to Cameron, west to Val Verde and El Paso cos.

NESTING: *Nest*: In meadows, marshes, pastures, or dry land, often not far from water; in grass, among bushes, or other low vegetation; on ground; slight shallow nest, but more substantial when on wet ground; made of twigs, dry grass, stubble, or weed stalks; lined with similar material, sometimes green moss. *Eggs*: 2–8, usually 4–5; oval or short ovate to ovate; bluish white, pale greenish white, or dull white; unmarked or with a few spots of reddish brown, lilac, or pale buff; average size, 46.0 × 36.1 mm.

Osprey: Pandionidae

OSPREY, *Pandion haliaetus* (Linnaeus)

SPECIES ACCOUNT

Also known as Fish Hawk. *Adult*: dark brown above; white head, brownish-flecked on crown and nape; broad blackish streak through eye forming bold mask; white below, more or less brownish-spotted on chest. In flight, the very long, narrow wings have a distinctive crooked appearance; also reveals blackish carpal-patches ("wrists"), and several (5 to 7) dusky bars on underside of tail. *Immature*: similar, but feathers buffy-tipped above; more heavily spotted on chest. Length, 22 in. (male), 24 (female); wingspan, 5¼ ft. (male), 5¾ (female); weight, 3¼ lbs. (male), 3½ (female).

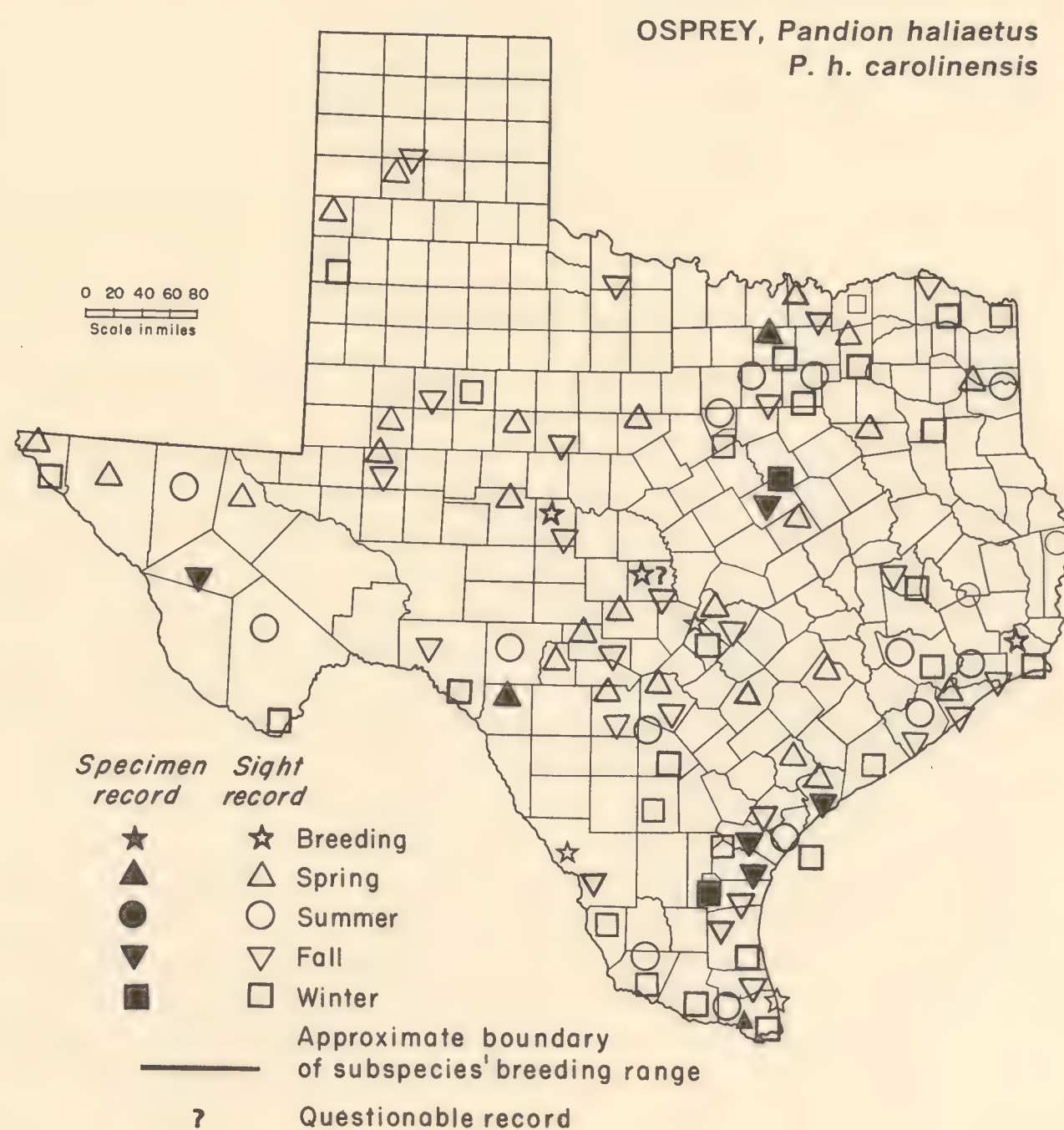
RANGE: Cosmopolitan, on seacoasts and large bodies of fresh water, breeding mainly in Northern Hemisphere; also rarely and irregularly in scattered areas of Southern Hemisphere, chiefly Australia and islands of Melanesia. Northern populations winter south to tropical Africa, India, Ceylon, Chile, and Argentina.

TEXAS: (See map.) *Breeding*: Five reports: Concho Co., south Brady Creek (several pairs found breeding, 1884–1886, W. Lloyd); Jefferson Co., Port Arthur (nest examined, 1925, Bessie Reid); Cameron Co., Port Isabel (breeding, 1908–1910, A. P. Smith); Webb Co., along Rio Grande near Laredo (nesting pair brought off young, mid-1950's, V. W. Lehmann, fide D. N. Russell); Hays Co., just east of San Marcos (pair raised young, 1967 and 1968, fide Russell). *Migration*: Late Mar. to mid-May; mid-Sept. to mid-Dec. (extremes: Feb. 21, June 7; Aug. 12, early Jan.). Fairly common to scarce virtually throughout. *Winter*: Late Dec. to mid-Feb. Scarce to rare near coast and along lower Rio Grande from Falcon Dam to mouth; casual elsewhere in eastern half; overwinter records from western half lacking.

HAUNTS AND HABITS: The Osprey, sole member of Pandionidae, has three remarkable adaptations for firmly grasping its slippery prey: reversible outer toes; extra long, sharp, and decurved claws; and horny spines on the undersides of its feet. Chief Osprey habitat requirements—from subarctic to Tropics—are an extensive body of clear fishing water, fresh or salt, and an elevated place for its nest site. Although nearly cosmopolitan, the species is widely scattered and nowhere

common; in North America especially, birds have sharply declined due, in large part, to the effects of pesticides on their reproductive capabilities. In autumn, northern transients, often trailing migrating schools of fish, move southward usually along seacoasts or major inland rivers. However, lone Ospreys, or pairs, also migrate over dry rangeland. Ospreys in Texas are chiefly migrants; some winter, and a very few pairs still (late 1960's) nest sporadically.

Flight is powerful and well sustained—deliberate on occasions, at other times swift and dashing. Strokes of the long slim wings are alternated with short glides at which time wings form a slight dihedral. In flight, an Osprey's wing is somewhat crooked at the wrist; this angulation—a distinctive *Pandion* trait—is usually observable at a long distance. When fishing, the bird flies from thirty to one hundred feet in the air as it eyes the water below. When a fish—ordinarily a near-the-surface species—is spotted, the Osprey hovers to get in stooping position, then it plunges on half-closed wings. The dive begins head long, but the bird virtually always swings backward, thrusts out its braced legs, and enters



the water talons first. The Osprey occasionally completely submerges. Invariably the catch is carried in the bird's claws with the head facing into the wind; if not caught in this position, the fish is shifted as the bird flies back to the feeding perch or nest. Individuals vigorously defend their fishing waters from intrusions of other Ospreys. Saltwater fish taken include menhaden, mullet, sea catfish, croakers, weakfish, and drum; suckers, sunfish, perch, and trout are chief freshwater species.

The Osprey is very noisy about the nest. In alarm, it repeatedly utters very peevish-sounding *cheep*'s, which, if the bird is further aroused, become longer, shriller screams interspersed with *ick ick* notes. Another common note, also heard during migration, is a whistled *whew whew whew whew* with a rising inflection.

CHANGES: In the northeastern United States, hatching success of nesting Ospreys started falling in the 1950's and crashing in the 1960's. For example, at the mouth of the Connecticut River, Roger Tory Peterson witnessed a drop from 150 active nests in 1954 to 17 in 1964. DDT and related pesticides which the Osprey ingests with its fish prevent proper eggshell formation. When the big bird tries to incubate her eggs, they collapse or otherwise fail to produce viable Ospreylets.

Very surprisingly, breeding Fish Hawks in Texas, one of the heavily polluted states, seem to be (as of 1968) doing as well as ever, but apparent success here is not going to save the species from extinction—there seem to be only five nesting reports in all Texas history!

Migrants and wintering individuals superficially appear to be holding their own. In the Lone Star State for the 1949 season, 2 out of 17 Audubon Christmas Bird Counts reported 3 birds; in 1970, 6 out of 53 counts yielded 7 Fish Hawks. It is noteworthy, however, that most of the 1970 Christmas Count compilers boldfaced their Ospreys in order to indicate extreme rarity. These naturalists have read grim evidence from the northern states that the old birds of this long-living species are not replacing themselves.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN OSPREY, *Pandion haliaetus carolinensis* (Gmelin)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Top of head and upper nape white, more or less tinged posteriorly with buff or light cinnamon; center of crown broadly streaked with chaetura black; remainder of upper parts between clove brown and fuscous black, feathers with inconspicuously paler margins and tips; tail between hair brown and fuscous, narrowly tipped with white, and on all but central pair of feathers several broad bars of white or buffy white on inner webs except at tips, shafts of rectrices mostly yellowish white; primaries fuscous black becoming terminally whitish, and mottled with dark brown on basal portion of inner webs; secondaries clove brown, paler on inner webs, and with broad whitish bars basally on inner webs; side of head white but with broad dull black stripe from eye to occiput; lower surface white with a few shaft streaks or spots of fuscous and buffy brown on jugulum; lining of wing between olive brown and fuscous, with markings of white and cinnamon.

Bill black, bluish black, or brownish black but cinereous at base; cere light bluish gray, cinereous, or slate color, but top black; bare skin above eye light gray; eye-ring dull black; iris lemon yellow or reddish brown; legs and feet light grayish blue or pearl gray, sometimes tinged with brown; claws bluish black. *Adult male, winter:* Acquired by prolonged postnuptial molt. Like nuptial adult male, but dark colors somewhat richer. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but fuscous spots or streaks on jugulum larger and more numerous. *Adult female, winter:* Acquired by prolonged postnuptial molt. Similar to nuptial adult female, but dark portions of plumage usually somewhat richer. *Male and female, second winter:* Acquired by complete postnuptial molt. Identical with adults in winter. *Male and female, first nuptial:* Acquired by partial prenuptial molt and wear from first winter, with which it agrees, except light tips of feathers are white instead of buff and much narrower; head and neck more whitish. *Male, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to nuptial adults, but lower surface white without dark markings; head and hindneck more heavily streaked with black or dark brown; all feathers of upper parts broadly edged with white to pale buff. Bill and cere black or slate black, but base of mandible and rictus cinereous or pale blue; iris cadmium yellow; eyelids black; legs and feet very pale pearl blue or greenish white; claws black. *Female, first winter* (juvenal plumage of most authors): Like first winter male but with streaks or spots of fuscous or wood brown on jugulum or breast; pileum and lower surface usually tinged with pale cinnamon buff. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Pileum and remainder of upper parts to and including upper rump clove brown to fuscous, broad median stripe from hindneck to rump dull cartridge buff; chin, throat, and jugulum between olive brown and fuscous; middle of breast and upper abdomen olive brown to light fuscous, all these dark areas above and below with dull cartridge buff tufts, which mottle all parts except pileum; remainder of lower parts dull cartridge buff. *Natal:* Anterior upper parts dull light pinkish buff; lower surface similar but lighter; narrow line on forehead and crown, together with lores, postocular stripe from eye below auriculars and around hindneck, and upper anterior part of wings and lower back, olive brown to bone brown; posterior upper parts mottled with buff and with middle stripe of buff.

MEASUREMENTS: *Adult male:* Wing, 460.0–487.9 (average, 476.2) mm.; tail, 201.9–213.1 (210.3); bill (culmen from cere), 31.5–33.5 (32.8); height of bill at base, 20.1–22.1 (20.9); tarsus, 54.1–63.0 (58.7); middle toe without claw, 41.9–45.0 (43.2). *Adult female:* Wing, 475.0–501.9 (490.0); tail, 206.0–227.1 (218.7); bill, 31.5–36.1 (34.5); height of bill, 20.6–22.6 (21.9); tarsus, 56.9–63.5 (60.2); middle toe, 42.9–48.0 (45.2).

RANGE: N.w. Alaska, s. Mackenzie, and Labrador, south locally to Baja California, Sonora, Sinaloa, Nayarit (Tres Marias Islands), Arizona, Texas, Gulf states, and Florida; also Guatemala (at least formerly). Winters chiefly from California, Texas, and Florida through Mexico and Central America to Peru, Brazil, n. Argentina, and Paraguay; also Galápagos Islands, Cocos Island, and West Indies.

TEXAS: *Breeding:* See species account. *Migration:* Collected north to Denton, south to Calhoun and Cameron, west to Kinney and Jeff Davis cos. *Winter:* See species account.

NESTING: *Nest:* In forests, strips of timber along streams or in open country, usually near large stream or other body of water; in tree, on cliff, rock pinnacle, roof, chimney of building, telephone or light pole, sometimes on the ground; large bulky platform, or occasionally, when on ground, of little material; composed of sticks, driftwood, cornstalks, weed seedlings, dry seaweeds, and similar materials; lined with grass, seaweed, bark, or a few feathers. *Eggs:* 2–7, usually 3; short ovate, elongate ovate, or ovate to elliptical; white, buffy white, or reddish fawn; sometimes with but few spots; but, as a rule, heavily blotched and spotted with various shades of dark and reddish brown, and with shell markings of drab and lavender; average size, 62.0 × 46.0 mm.

Falcons: Falconidae

CARACARA, *Caracara plancus* (Jacquin)

SPECIES ACCOUNT

Caracara cheriway of A.O.U. check-list, 1957 (see Appendix A). Often put in the genus *Polyborus*. Crested Caracara, Common Caracara, and Mexican Eagle of some authors. A large, eaglelike, crested bird with pale bluish beak; reddish cere and skin on face; long yellowish legs. *Adult*: black above (including crest), and on abdomen and thighs; cheeks, broad neck-collar, throat, breast, and crissum white, the feathers of breast and hindneck finely black-tipped. In flight, reveals prominent whitish subterminal wing-patches; white upper tail-coverts and tail, the latter with terminal black band. *Immature*: rufous brown above; cinnamon-streaked brown breast and abdomen; wing and tail pattern as in adult. Length, 22½ in. (male), 23½ (female); wingspan, 4 ft. (male), 4¼ (female); weight, 1¾ lbs. (female).

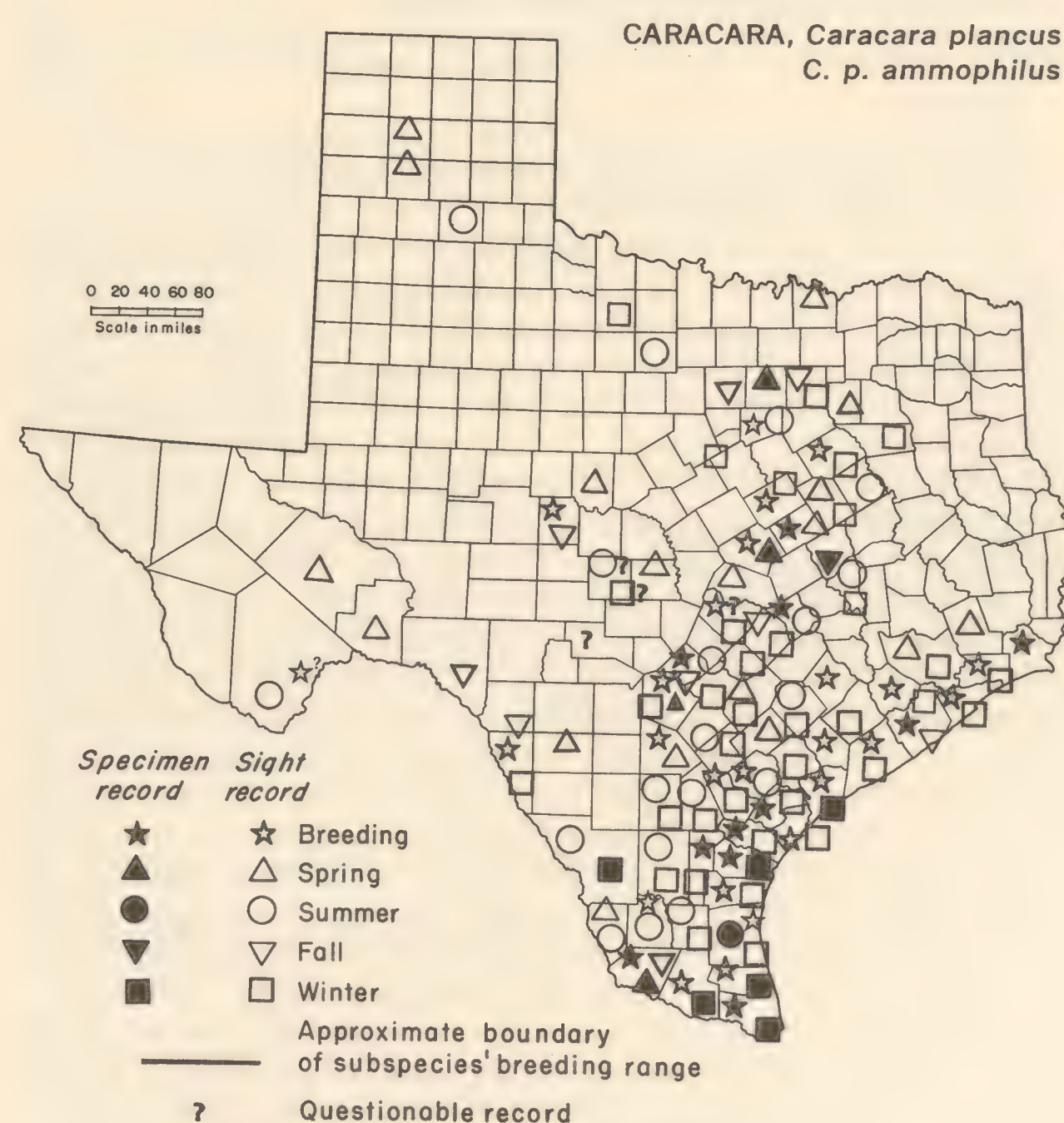
RANGE: Chiefly lowlands, from n. Baja California and Zacatecas to c. Texas, south through Mexico, Central America, and South America to Tierra del Fuego and Falkland Islands; also c. Florida, Cuba and Isle of Pines.

TEXAS: (See map.) *Resident*: Breeds, Jan. to Sept. (eggs, Jan. 30 to June 14; young birds in nest as late as Sept.) from near sea level to 2,200 ft. Fairly common to uncommon in south Texas brush country and on coast north to about 29th parallel; uncommon to scarce and somewhat irregular in central portions from San Antonio and Gonzales north to Waco and Navarro Co., scarce and irregular northwest to Johnson Co., and on upper coast (local). Formerly bred on Edwards Plateau: eastern Concho Co. (nest and eggs, Apr. 24, 1881, W. Lloyd). May have bred in Brewster Co., 10 mi. north of Terlingua (pair apparently nesting in cottonwood, 1922, Stan Fulcher, fide R. H. Wauer). *Vagrant*: Wanders northward irregularly to Coleman, Baylor, and Grayson cos., where rare; casual straggler to northern Panhandle and eastern Trans-Pecos.

HAUNTS AND HABITS: Found only in the New World, the Caracara is an aberrant member of the fifty-eight-species cosmopolitan Falconidae. Its long legs and naked face are adaptations for eating carrion. From the U.S.-Mexico border and Florida to South America, it ranges warm, usually rather dry prairies, savannahs,

and pampas. This bird—perched on pricklypear cactus with rattlesnake in beak—also resides on the great seal of the Republic of Mexico. In the Lone Star State, the Caracara is a characteristic bird of coastal grasslands and south Texas brush country. It is generally seen singly, in parties of two or three, or gathered with vultures at a carcass; in the nonbreeding season, larger groups, sometimes up to ten individuals, share nighttime roosts in oak mottes or mesquite groves.

Usual flight of the Caracara, suggesting that of a raven, is direct and swift with noisy wing-beats. Because of this raptor's unusually long and thick neck, the wings appear to join its body amidships; this produces a very odd "flying cross" silhouette. When scouting for carrion or prey, the bird often flies high above the tree-tops; flaps are interspersed with long glides on downward-bowed wings. It also skims close to the ground Marsh Hawk style. More terrestrial than many birds of prey, the long- and strong-legged Caracara at times gives chase on the ground to mice, rabbits, snakes, and insects; other animate things in its diet include frogs, lizards, and turtles. Carrion is secured with one foot as



the bird tears off edible portions. The Caracara is capable of flying off with food clasped in its beak; occasionally, in its rather weak talons. Quite resourceful and aggressive, it sometimes harasses pelicans, gulls, vultures, and other large birds until they release or disgorge their food.

The name Caracara, of Guarani Indian origin, derives from the bird's infrequent *cara-cara* cry (also rendered *traro-traro*); this the bird usually cackles—head thrown back—from a high perch in a tree early in the morning or near sunset. Recordings of a feeding adult sound like the deep grating produced by a stick drawn rapidly across a wooden wash board. A bird, as if clearing its throat, also sounds an *eh-eh-eh*.

CHANGES: The Caracara is only partly vulturine in its feeding habits, but it too is declining along with the Cathartidae. Depressing factors seem to be similar to those operating against the Black Vulture, but the less specialized Caracara is sinking more slowly. Highest Caracara numbers in the nation on annual Audubon Christmas Bird Counts have so far all been in Texas, with Laguna Atascosa National Wildlife Refuge, Cameron County, usually showing the largest figure. Present-day-style coverage on Audubon Christmas Bird Counts began in Texas in 1948, when the high count was 25 Caracaras at Harlingen; top figure in 1949 was 14 at Laguna Atascosa. During the 1950's the average annual largest count was 28.6 individuals; the average in the 1960's was 7.8 birds per year. The biggest drop in Texas Caracaras followed the 1957 Christmas season—from a total of 53 in that year to 16 in 1958, and to 7 in 1959. In 1970, the feeble number of 4 at Port Mansfield captured top honors in Texas and the nation; 4 individuals at Laguna Atascosa in 1971 again won the national high count.

DETAILED ACCOUNT: ONE SUBSPECIES

MEXICAN CARACARA, *Caracara plancus ammophilus* (van Rossem)

Considered part of *Caracara cheriway audubonii* by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Upper parts, including wings, fuscous black or chaetura black; longest upper tail-coverts white, plain or narrowly barred with hair brown; hindneck cream color, cream buff, or buffy white, center of back numerously barred with same color; broad terminal portion of tail fuscous black, remainder white, numerously and narrowly barred with fuscous black and hair brown; basal or middle portion of several outer primaries white, mottled and barred with hair brown; chin, upper throat, and cheeks plain white or creamy white; jugulum and sides of neck cream color or cream buff with numerous bars of chaetura black or fuscous black, this whitish area joining with that of nape and upper back and forming broad collar; lining of wing fuscous black or chaetura black as are lower breast, abdomen, and thighs; lower abdomen more or less mixed or edged with buffy white or pale buff; lower tail-coverts buffy white or pale buff. Bill pale blue, yellow on edges and tipped with yellowish white; cere carmine orange or orange-yellow; bare skin of face and chin orange-red to orange-yellow; inside of mouth bright yellow; iris raw sienna or dark brown; legs and feet pale yellow, chrome yellow, or orange-yellow; claws black. *Adults, winter:* Acquired by wear from nuptial adults. Like nuptial adults but usually somewhat paler. *First nuptial:*

Acquired by complete prenuptial molt. Similar to nuptial adults, but black areas of plumage replaced by bister or warm sepia; white areas now much tinged with buff. *First winter* (juvenile plumage of most authors): Acquired by complete post-juvenile molt. Pileum vandyke brown, obscurely and narrowly streaked with black; nape cinnamon buff or pinkish buff, somewhat streaked with light cinnamon brown; remainder of upper surface dark sepia or bister, feathers more or less varied with lighter brown, middle of back light cinnamon brown varied with dull buff, chiefly on tips of feathers; broad tip of tail between olive brown and sepia, remainder of tail dull white or very pale buff, narrowly and rather brokenly barred with hair brown or drab; middle portion of most of primaries barred with white and pinkish buff; tips of outer lesser wing-coverts and median coverts buffy white; chin and throat like nape but unstreaked; breast and abdomen bister, chestnut brown, or cinnamon brown, streaked with dull cinnamon or cinnamon buff; thighs same but feathers with lighter tips; crissum pale buff or buffy white; lining of wing dull olive brown. Bill pale green at base becoming nearly white at tip; bare portion of face dull purplish red, but dull white on subocular area; iris brown; legs and feet yellowish white. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Similar to natal, but pileum more grayish (less rufescent) brown; remainder of upper surface duller, more grayish (less cinnamon) buff; buff lower surface also duller, more grayish. *Natal:* Pileum walnut brown; posterior upper surface dull cinnamon buff, median stripe darker, inner portions of wings and stripe on each side of lower back between snuff brown and buffy brown; lower parts, with nape and upper back, light cinnamon buff.

MEASUREMENTS: *Adult male:* Wing, 359.9–382.0 (average, 371.1) mm.; tail, 186.2–202.9 (198.1); bill (culmen from cere), 31.0–32.5 (31.8); height of bill at base, 25.9–29.2 (27.4); tarsus, 85.1–89.9 (88.1); middle toe without claw, 48.0–54.1 (50.0). *Adult female:* Wing, 382.0–400.0 (391.2); tail, 201.9–228.1 (217.9); bill, 32.0–33.5 (32.5); height of bill, 26.7–29.9 (27.9); tarsus, 87.9–91.4 (89.4); middle toe, 49.0–51.1 (50.3).

RANGE: N. Baja California, s. Arizona (a few), s. New Mexico (rarely), and s. Texas, south to Nayarit, Nuevo León, and Tamaulipas.

TEXAS: *Resident:* Collected north to Bell and Falls (eggs), east to Jefferson (eggs), south to Cameron, west to Webb and Bexar cos. *Vagrant:* Two shot (specimens?) in Tarrant Co., Fort Worth (spring, ca. 1907, G. E. Maxon).

NESTING: *Nest:* On prairies or hill slopes, in brush or woodland; usually in low tree or bush, but ranging from 5 to 50 ft. above ground; loose, bulky platform of sticks, weeds, grass, and leaves; lined with twigs, roots, grasses, cotton, or Spanishmoss. *Eggs:* 2–4, usually 2; oval to ovate or rounded ovate; cream white, buff, or bright cinnamon; heavily blotched and spotted with dark brown, black, cinnamon, and various other shades of brown; average size, 59.9 × 47.0 mm.

PRAIRIE FALCON, *Planofalco mexicanus* (Schlegel)

SPECIES ACCOUNT

Falco mexicanus of A.O.U. check-list, 1957 (see Appendix A). *Adult:* resembles an immature Peregrine but is even paler. Buff-scaled brownish above, streaked blackish on crown; whitish line over eye; whitish throat and sides of neck; vague brownish postocular patch; dark brown vertical streak under eye; whitish below, spotted and streaked with brown. In flight, reveals black axillar-patch. *Immature:* darker brown above; heavily brown-streaked cinnamon buff below. Length, 16¼ in. (male), 19 (female); wingspan, 3¼ ft. (male), 3½ (female); weight, 1¼ lbs. (male), 1¾ (female).

RANGE: C. British Columbia to w. North Dakota,

south to Baja California, s. Arizona, New Mexico, and w. Texas. Winters throughout breeding range and south in Mexico to Zacatecas, Hidalgo, and Oaxaca.

TEXAS: (See map.) *Breeding:* Two definite records: Randall Co., Cañoncito Blanco (nest found, June 3, 1876, C. A. H. McCauley); El Paso Co., Hueco Tanks (young old enough to fly, Mar. 4, 1951, George and Mary Burrows). Said to breed, but details lacking: Jeff Davis Co., Davis Mts. ("several nesting pairs," Dave Galland, fide R. H. Wauer); Presidio Co., Alamito (rare, 1890; breeds in caves of bluffs, fide W. Lloyd). Rare and local. *Winter:* Early Aug. to late Apr. (extremes: July 17, May 11). Uncommon to scarce in western third; increasingly rare and irregular eastward to 96th meridian and upper coast.

HAUNTS AND HABITS: The Prairie Falcon displays well the dashing traits of Falconidae, whose members are the most streamlined of all predatory birds. Breeding chiefly in the U.S. Northwest, this uncommon bird of prey is the prairie, plain, and desert counterpart of the coast-, woods-, and mountain-seeking Peregrine; at times, however, it ranges to low grassland and brush country or to high wooded mountains that fringe its usual haunts. The senior editor once saw an individual perched on a steep barren rock slide at about 13,000 feet on Mount Evans, Colorado. Prairie Falcons require cliffs for nesting, and during the breeding season pairs zealously maintain large territories; these factors help account for the species' few numbers, but nowadays, along with many other raptors, it is getting rarer, especially east of the Rockies. Like the Peregrine, it is a solitary hunter. Alone or in pairs it is usually seen on its lookout perch—a telephone pole, fence post, or limb of a dead tree—or flying swiftly and low across the prairie.

On long slim pointed wings—designed for speed, not for soaring—the bird moves with powerful choppy strokes; fifty to three hundred feet is the standard height at which it flies. Most hunting is done in early morning and evening. Birds are preferred prey, especially sparrows, Brewer's Blackbird, and meadowlarks; however, the Prairie Falcon also takes Gambel's Quail, Band-tailed Pigeon, Mourning Dove, jays, and occasionally ducks, coots, and gulls. Capture is usually in mid-air, after which the falcon returns to its feeding perch. Pocket gophers, mice, young rabbits, and other small terrestrial prey are plucked up effortlessly as the bird swoops down. Sometimes the bird hops about on the ground in pursuit of lizards and insects.

The alarm cry of the Prairie Falcon is a rapid *kee kee kee*, etc. (also described as *kik kik kik*) which is similar to that of a Sparrow Hawk, but louder and more fierce sounding.

CHANGES: Survival problems of the Prairie Falcon would appear to be even greater than those of the Peregrine. The latter is almost cosmopolitan, but *P. mexicanus* is restricted to a portion of the drier parts of the North American continent. Each species is about equally thinly spread over its habitat, but the much wider distribution of *P. peregrinus* should allow it to survive in parts of the planet that are less poisoned than the U.S.A.

For the first half of the twentieth century, the Prairie ranked as the second rarest of the Texas Falconidae; the very rarest was the virtually extirpated Aplomado. In the 1950's and 1960's, as DDT and other hard persistent poisons built up in soil and water, there was a change. The previously more flourishing Peregrine dropped to the Prairie's very low level. Successful nesting—always a rare event for either species in the state—has been hovering right at zero since 1951, the year in which a pair of Prairie Falcons apparently raised a brood of young at Hueco Tanks, El Paso County.

Audubon Christmas Bird Counts give a snapshot picture of Texas winter populations. In 1949, out of a total of 17 counts, no Prairie Falcons were found; in 1970, 2 counts out of 53 yielded a total of 3 birds. Comparable figures for the Peregrine are: 1949, 4 counts out of 17 reported 14 individuals; in 1970, 3 counts out of 53 had 3 birds.

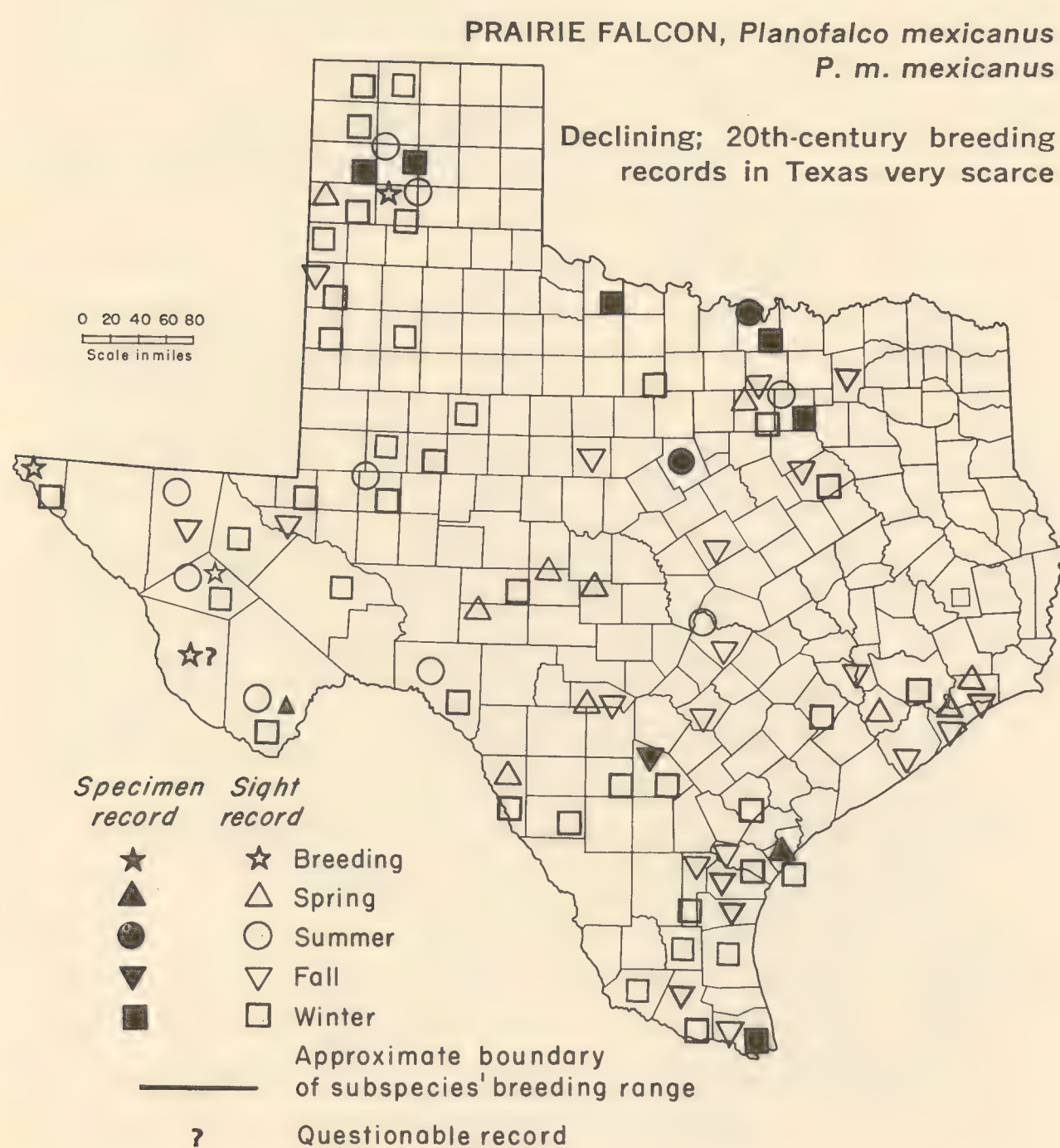
Probably the Peregrine's downfall is its habit of living along seacoasts where it feeds on fish-eating birds. Since 1950, Texas coastal waters, especially near Houston and Brownsville, have been ever more heavily polluted with agricultural and industrial chemicals. In the Prairie Falcon's aridland habitat general pesticide levels are somewhat lower.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN PRAIRIE FALCON, *Planofalco mexicanus mexicanus* (Schlegel)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear



from winter plumage. Forehead white to cream buff; rest of pileum dark dull wood brown becoming more cinnamon on occiput, and with narrow shaft streaks of fuscous; fuscous-streaked band of light buff to cinnamon buff on occiput, connecting on each side with superciliary stripe which is buffy white or pale buff mixed with fuscous; also fuscous-streaked buff nuchal collar behind occipital band; remainder of upper surface dull fawn color to drab, broadly and conspicuously barred with light fuscous or dull hair brown; tail feathers, including middle pair, light drab, numerous barred with drab, vinaceous buff, and pinkish buff, and rather broadly tipped with buffy white or pale buff; wing-quills and upper coverts mostly hair brown, barred or spotted on inner webs with pinkish buff or white, and on outer webs of secondaries and both webs of tertials and wing-coverts with dull fawn color to drab; sides of head buffy white with broad auricular area and rictal streak of fuscous; lower parts white or buffy white, breast and jugulum narrowly streaked with fuscous; abdomen with many rounded spots of fuscous; flanks barred broadly with fuscous, cinnamon buff, and dull white; thighs barred or spotted with fuscous; lining of wing buffy white, spotted and imperfectly barred or streaked with fuscous; axillars dull drab with spots of dull cinnamon. Bill plumbeous, base yellow; cere and bare orbital region yellow; iris dark brown; legs and feet yellow; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but upper surface darker, more cinnameous; lower parts more washed with pale buff. *First nuptial*: Acquired by wear and fading from first winter. Similar to nuptial adults, but upper parts darker and duller, feathers mostly without conspicuous bars, but with tips and edgings of dull buff or cinnamon buff; light-colored occipital and nuchal bands more whitish (less buffy or cinnameous); tail less strongly barred, middle feathers only obscurely or not at all barred, remaining rectrices mostly plain on outer webs; entire lower parts more heavily marked and posteriorly these fuscous markings more inclined to streaks than to bars or spots. Base or all of bill and cere pale blue; iris umber brown; legs and feet light dull blue, dull gray, greenish yellow, or lemon yellow. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to first nuptial, but still darker and more rufescent above, margins and tips of feathers on entire upper surface broader and much more rufescent, often tawny or auburn, becoming cinnamon buff on tips of primaries and secondaries; lower surface cinnamon buff instead of buffy white. Bill bluish white or pearl gray, terminally slate color or plumbeous, tip black; cere, corner of mouth, and orbital region pearl gray or greenish white; iris vandyke brown or broccoli brown; legs and feet pale greenish yellow, bluish white, or light slate color; claws slate black. *Juvenal* (second natal down of most authors): White, slightly tinged with buff. *Natal*: Entirely white.

MEASUREMENTS: *Adult male*: Wing, 289.1–308.1 (average, 299.0) mm.; tail, 153.4–179.1 (167.9); bill (culmen from cere), 18.0–20.1 (18.8); height of bill at base, 15.0–17.5 (16.3); tarsus, 50.0–56.9 (53.8); middle toe without claw, 40.9–45.5 (43.7). *Adult female*: Wing, 337.1–357.1 (344.4); tail, 184.9–200.9 (195.6); bill, 21.1–25.9 (22.9); height of bill, 17.5–19.0 (18.5); tarsus, 56.9–64.0 (60.2); middle toe, 49.0–53.1 (50.0).

RANGE: S.e. Washington, s. Alberta, c. Saskatchewan, and w. North Dakota, south to s. Arizona, New Mexico, and Trans-Pecos and Panhandle Texas. Winters chiefly from Montana and n.w. Iowa to s. Baja California, Sonora, Hidalgo, and Tamaulipas.

TEXAS: *Breeding*: See species account. *Winter*: Taken north to Oldham and Potter, east to Cooke and Aransas (Apr. 16), south to Cameron, west to Brewster (Mar. 25) cos.

NESTING: *Nest*: On cliffs, usually along streams; on ground, in tree, or on rocky ledge; shallow mass of sticks and roots, sometimes lined with weeds, grasses, animal fur, and feathers, often no nest at all; eggs then laid on sand or stony ground. *Eggs*: 2–6, usually 3–5; oval to ovate or elliptical ovate; smooth or finely granulated; cream white to brownish buff; much

blotched and spotted with various shades of reddish brown and with clay color; average size, 53.1 × 41.4 mm.

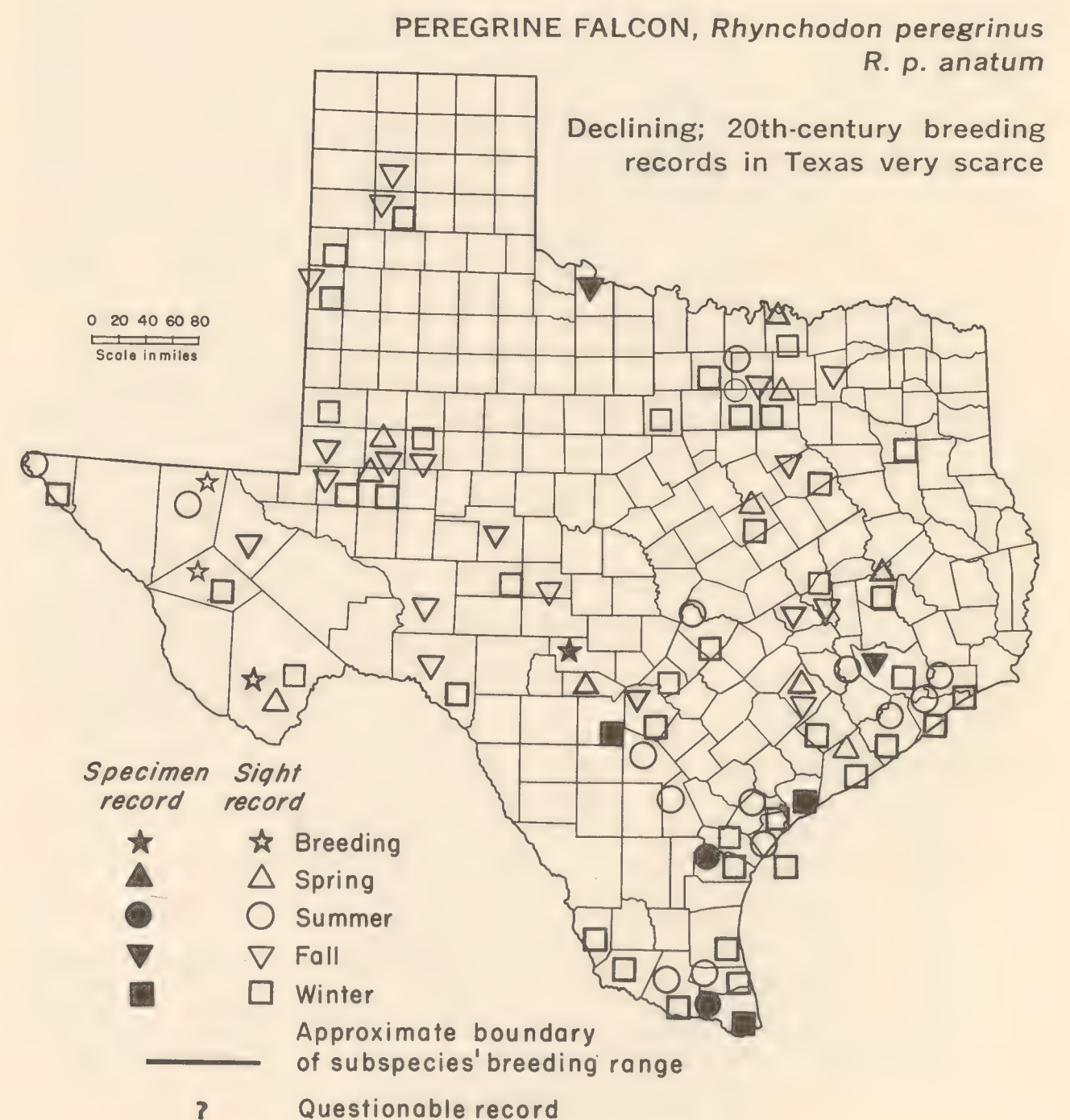
PEREGRINE FALCON, *Rhynchodon peregrinus* (Tunstall)

SPECIES ACCOUNT

Falco peregrinus of A.O.U. check-list, 1957 (see Appendix A). Duck Hawk of older American authors. A medium-to-large, very streamlined, swift-flying falcon. *Adult*: dark gray above with blackish crown; white chin, throat, and sides of neck; side of head with a bold black wedge pointing downward from eye; small blackish bars and spots on buffy breast and belly. *Immature*: dark brown above; rather heavily blackish-streaked cinnamon buff below. Length, 16½ in. (male), 19¼ (female); wingspan, 3¼ ft. (male), 3½ (female); weight, 1½ lbs. (male), 2½ (female).

RANGE: Almost cosmopolitan. On all continents (except Antarctica), and many oceanic island groups (notable exceptions include New Zealand, isles in e. Pacific, and Hawaiian Islands, but nonbreeders accidental in latter locality). In Western Hemisphere: throughout most of North America north of Mexico, and in n. Baja California and Sonora (Gulf of California islands); in South America, from n. central Chile and Argentina to Tierra del Fuego and Falkland Islands. Northern races winter to subtropics and Tropics. North American and European populations are declining severely in 20th century.

TEXAS: (See map.) *Breeding*: Mar. to July. Rare and highly local in Trans-Pecos: Brewster Co., along summit of Crown Mt. in Chisos range (nest containing



young discovered in deep cleft about June 8, 1901, Vernon Bailey; young still occupying nest, June 24, 1901, H. C. Oberholser), along west face of Casa Grande (an apparently mated pair observed, Apr. 27, 1935, G. M. Sutton), over Emory Peak (1 adult and 2 young seen, July 21, 1967, R. H. Wauer); Jeff Davis Co., along Limpia Canyon in Davis Mts. (pair feeding young at nest on high cliff, June 24, 1969, Pansy Espy and Jody Miller); Culberson Co., McKittrick Canyon in Guadalupe Mts. (nesting observed in high cliffs, June, 1939, W. B. Davis, et al.; single squealing bird observed entering and leaving depression in high cliff, but signs of nesting not visible, May 26, 1970, G. A. Newman). Formerly bred on Edwards Plateau: Kerr Co., 70 mi. northwest of San Antonio (breeding female collected, May 23, 1902; nest with 4 eggs discovered, Mar. 20, 1908, G. A. Abbott). *Winter*: Early Sept. to mid-May (extremes: July 21, June 5). Uncommon to scarce along coast; scarce to rare in remainder of state east of Pecos River; rare west of Pecos River (but fairly common through Big Bend during spring, fide R. H. Wauer). *Vagrant* (chiefly nonbreeders, unsuccessful nesters, and immatures): June 11 to late July. Rare and unpredictable in eastern half; most frequent near coast.

HAUNTS AND HABITS: Within the historic period, the Peregrine Falcon has been uncommon on two counts: It was a favorite of royal falconers—thus not to be considered a “commoner”—and its population has been thin. Nonetheless this near-cosmopolitan species is noted for having a phenomenally wide and diverse distribution: It nests from coasts to mountains of most climate zones—in steppes, grassland, or scrubland to forested areas—wherever it locates a suitable high cliff ledge for its aerie; however, it avoids some extremes, notably very arid deserts and humid tropical rain forests. Nowadays in Texas, as in all of the United States east of the Mississippi, breeding appears to be largely a thing of the past; a few migrant and winter birds occur primarily along the coast.

Normal flight, at speeds of 48 to 62 m.p.h., is on quick short wing-beats with brief gliding intervals. Migrants usually fly high and alone. This falcon's prowess as a hunter is well known. Incredibly swift, it compares only with the Prairie Falcon as the fastest North American raptor. A stooping Peregrine moves at speeds which have been estimated between 150 and 200 m.p.h.; however, recent computation with more accurate instruments suggests the bird may attain 275 m.p.h. (L. Brown and D. Amadon)! Usually the falcon drops from above and behind to seize its victim. It snatches small birds easily in mid-air; its powerful claws insure instant death. A larger bird receives a glancing blow which knocks it to the ground where, stunned or dead, it is retrieved by the Peregrine. The catch is at least partially plucked before being eaten. Plovers, sandpipers, ducks, and small geese are prime targets on coasts. Goatsuckers, woodpeckers, jays, robins, and blackbirds are taken in open woodlands, sparrows and meadowlarks in open country.

This falcon occasionally eats a few insects and preys on mammals. In Texas during the 1940's and 1950's at certain caves on the Edwards Plateau, notably Ney Cave near Bandera, a Peregrine and usually one or two Red-tailed Hawks would suddenly appear at the precise minute when an afternoon out-flight of Mexican freetail bats (*Tadarida mexicana*) was due to begin. As they erupted, the Peregrine, or Redtail, would select a bat, dash into the column of outrushing thousands, and grab the furry one in its talons. Peregrines were more graceful, but the lumbering Redtails also got their bats. This exhibition ended about 1960 when Peregrines in summer—the time of bat flights—became too few in Texas to keep the show going.

Rhynchodon peregrinus in warm weather must sustain itself with a daily intake of about 11 to 12 percent of its body weight; in cold months, this increases to 15 to 16 percent. Optimum habitat—such as Alaskan sea cliffs with a healthy supply of bird life—should support a pair of Peregrines every four to five miles.

The Peregrine is usually silent except about the aerie. A creaky-sounding *wi chew wi chew* appears to be of importance in the male's courtship. Protesting or alarmed birds utter raspy *cack cack cack*'s, varying to *hek hek hek* or *hak hak hak*; separated mates exchange clear wailing notes.

CHANGES: Since the end of the last Ice Age, 10,000 years ago, the climate in Texas has been too warm to induce enthusiastic breeding on the part of Peregrines. Nevertheless a few of these birds, in gradually diminishing numbers, nested in the state through 1969. Apparently the last firm record of breeding on the Edwards Plateau was a nest reported in Kerr County by G. A. Abbott in 1908. In the Trans-Pecos a nest with young was observed on a Davis Mountain cliff in 1969 by Pansy Espy and Jody Miller; in this same year R. H. Wauer, chief naturalist at Big Bend National Park, observed two summering pairs which he thought might be nesting. As recently as the spring of 1971, Wauer found a Peregrine pair tending a nest on the Mexican side of Santa Elena Canyon, Big Bend Park. These birds really picked a hot spot for nesting. Terlingua Creek, famous for its cinnabar (mercury) mines, drains into the Rio Grande at Santa Elena.

In addition to impaired reproduction caused by mercury and pesticides, Peregrines face another threat in the 1970's. The ancient sport of falconry is far from dead. Along the coast of Texas, chiefly on Mustang and Padre islands, falconers trap migrating and wintering Peregrines. Even though some of these birds are well trained and cared for, they are removed from the world's scant and dwindling breeding stock. The future is very dim. Hail and farewell to the royal bird of kings.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN PEREGRINE FALCON, *Rhynchodon peregrinus anatum* (Bonaparte)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by

wear from winter plumage. Forehead dull warm buff; top of head with nape blackish slate or dusky neutral gray to blackish neutral gray; back dusky neutral gray with numerous rather narrow bars of neutral gray or deep neutral gray; rump neutral gray with numerous bars of deep neutral gray; tail chaetura black with numerous bars of light neutral gray to deep neutral gray, paler basally and with very narrow dull grayish white or buffy white tip; wing-quills chaetura black or fuscous black, primaries barred on inner webs with light pinkish buff, buffy white, and hair brown, except near tips; remainder of wings and scapulars barred like back, but lesser wing-coverts mostly without bars, merely edged with somewhat lighter gray; chin, throat, sides of throat, and jugulum creamy white or pale pinkish cinnamon with few or no dark brown streaks; broad more or less triangular mustache of dull black or slate black; remainder of lower parts white, pale cinnamon buff, or ecru drab, more or less barred with chaetura black and hair brown; lining of wing white or buffy white, numerously barred with chaetura black and hair brown. Bill light grayish blue, darker on culmen, blackish at tip, pale green at base; cere and narrow unfeathered area around eye greenish or bright yellow; iris vandyke brown; legs and feet lemon yellow or chrome yellow; claws bluish black. *Adult female, nuptial*: Acquired by wear from winter. Like nuptial adult male but larger; posterior upper parts somewhat darker; lower parts more heavily barred and spotted and usually more buffy; bars on inner webs of primaries usually more deeply buff. Base of bill pearl gray, middle portion plumbeous; tip black; inside of mouth and tongue cinereous; orbital region pearl gray, washed with dull lemon yellow, but eye-ring canary yellow; iris prout brown or hazel; legs and feet maize yellow; claws black. *Adult male and female, winter*: Acquired by complete but irregular and protracted molt. Similar to corresponding sex of nuptial adults. *Male and female, second winter*: Acquired by complete molt from first nuptial. Like corresponding sex of adults in winter. *Male and female, first nuptial*: Acquired by wear from first winter, with which it is identical, except for paleness caused by fading. *Male, first winter* (juvenile plumage of most authors): Acquired by complete postjuvenile molt. Head and nape dull black, feathers broadly edged with light ochraceous buff; lower hindneck, back, and wings deep mouse gray, hindneck rather darker, all feathers broadly edged with dull light ochraceous buff; tail dull hair brown with spots or imperfect bars of same color, and broad tip of pinkish buff; lower parts, including lining of wing, cinnamon, cinnamon buff, or pinkish buff, broadly streaked with fuscous or chaetura black. Bill at base french gray, pearl gray, or pale dull blue, becoming cinereous on middle portion, black or blackish slate at tip and on culmen; cere french gray, plumbeous, or drab gray; bare orbital region bluish white or plumbeous; iris dark brown or russet; legs and feet chrome yellow, wax yellow, greenish yellow; pale grayish green with dull yellow on edges of scales, soles of toes, and hind part of tarsus; claws black. *Female, first winter*: Acquired by complete postjuvenile molt. Similar to first winter male, but feathers of pileum and nape margined with tawny, russet, cinnamon, and ochraceous buff; feather margins of other upper parts somewhat more richly colored; lower surfaces more deeply cinnamonous. *Juvenile plumage* (second natal down of most authors): Acquired by postnatal molt. Upper parts grayish white; lower parts cream white. *Natal*: Cream white.

MEASUREMENTS: *Adult male*: Wing, 301.0–321.1 (average, 312.2) mm.; tail, 137.9–153.9 (145.3); bill (culmen from cere), 18.0–21.1 (19.8); height of bill at base, 17.0–18.0 (17.5); tarsus, 45.5–51.6 (49.0); middle toe without claw, 43.4–52.6 (47.8). *Adult female*: Wing, 340.1–375.9 (357.1); tail, 167.1–192.0 (181.3); bill, 20.1–24.9 (23.6); height of bill, 19.0–21.1 (20.6); tarsus, 50.5–58.9 (55.1); middle toe, 52.1–59.4 (55.3).

RANGE: Locally from n. Alaska, n. Keewatin, and w. Greenland, south to n. Baja California, Sonora (Gulf islands), Arizona, New Mexico, Trans-Pecos Texas, Colorado, n. Arkansas, n. Alabama, and n.w. Georgia. Winters from s.w. British Columbia, s. Nebraska, and s. New Brunswick through United States, Mexico, and Central America to Patagonia; also West Indies.

TEXAS: *Breeding*: See species account. *Winter*: Taken northwest to Wilbarger (Sept. 1), east to Harris (Sept. 26), south to Calhoun and Cameron cos. One found dead (specimen?): Medina Co., Chicon Lake (Jan. 24, 1937, A. J. Kirn). *Vagrant*: One specimen: Nueces Co., Corpus Christi (July 25, 1887, J. M. Priour).

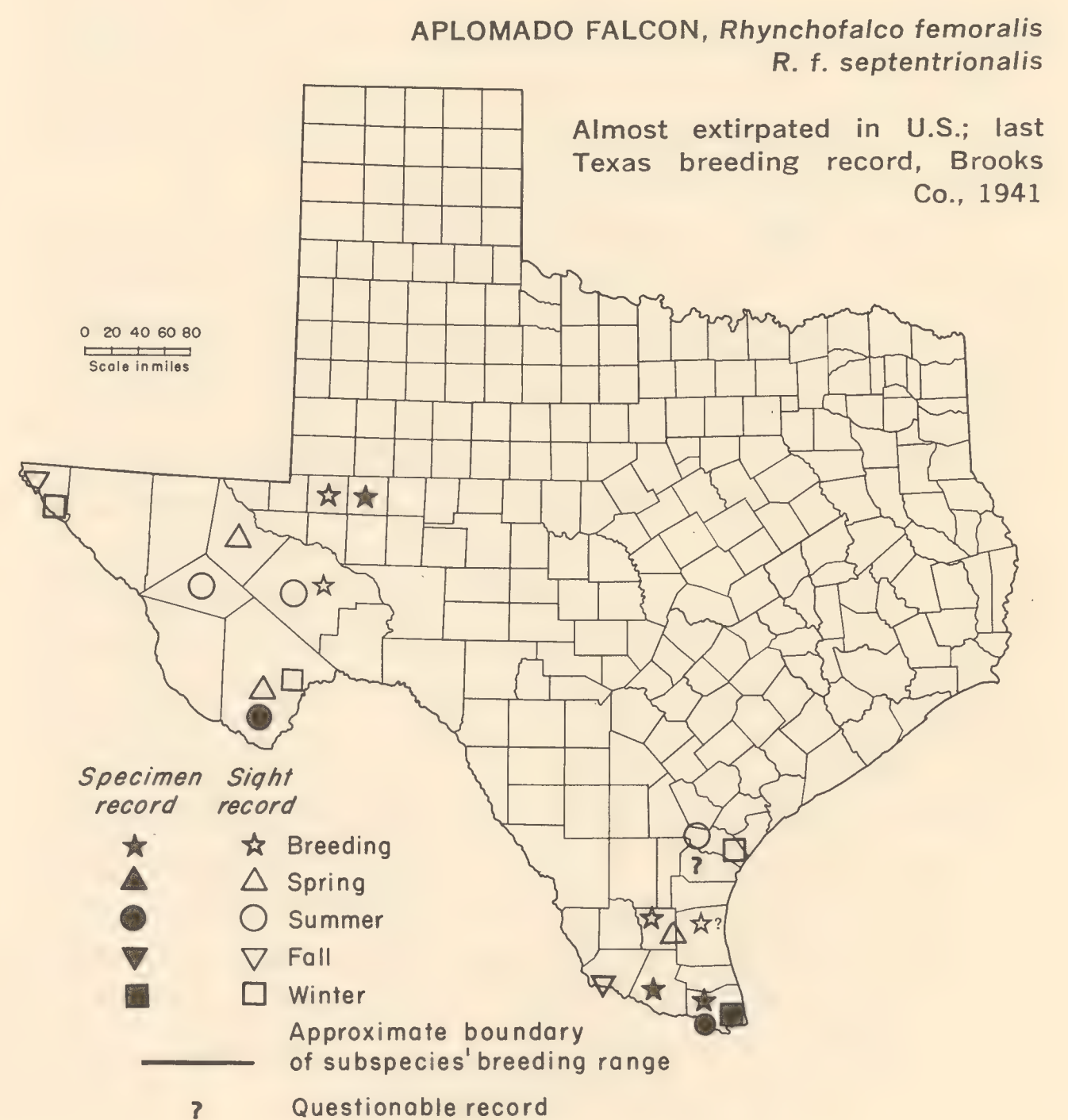
NESTING: *Nest*: In mountains or hills, usually along streams, on bluffs or cliffs; on ground, rocky ledge, cavity in cliff, or in hole in dead trunk of tree; usually no nest proper, but sometimes eggs laid on coarse twigs, grass, rubbish, and bones, with a little lining of feathers or decayed wood. *Eggs*: 1–7, usually 4; oval to elliptical oval, short ovate or ovate to elliptical ovate; cream white to light reddish brown, fawn color, or even light pink; marked heavily with various shades of dark brown or reddish brown; average size, 52.6 × 40.9 mm.

APLOMADO FALCON, *Rhynchofalco femoralis* (Temminck)

SPECIES ACCOUNT

Falco femoralis of A.O.U. check-list, 1957 (see Appendix A). Somewhat resembles the larger Peregrine. *Adult*: dark gray above with a distinct white or buffy line extending back from top of eye to form narrow collar on back of head; black postocular stripe and narrow vertical streak down from eye; tail with numerous whitish bars; buffy white breast; finely white-tipped blackish sides extending as band across belly; cinnamon on posterior under parts. In flight, whitish breast sharply contrasts with dark gray underwings and black belly-patch. *Immature*: face as in adult; dark brownish above; buffy below with black-streaked breast; unbarred blackish sides. Length, 15¼ in. (male), 16¼ (female); wingspan, 33¾ (male), 40 (female); weight (one male), 8 oz.

RANGE: S.W. United States (at least formerly), south



through Mexico to Guatemala (rarely); and from Panama (rarely) locally through South America to Tierra del Fuego; also Trinidad.

TEXAS: (See map.) *Breeding*: Late Feb. to Oct. (eggs, Mar. 3 to Sept. 12) from near sea level to 4,500 ft. Formerly (prior to ca. 1910) regular in much of southwestern portion from Rio Grande (El Paso to Brownsville) north to Ector and Midland cos., also on central coast (but nesting unconfirmed). One nesting record since 1910: southern Brooks Co., 32 mi. north of Edinburg (nest with 3 eggs, Mar. 13, 1941, F. F. Nyc, Jr.). Between ca. 1910 and 1941, rare visitor during breeding season to El Paso, Brewster, and Cameron cos.; last known specimen: Cameron Co., Port Isabel (Aug. 4, 1935, H. H. Kimball). Spring and summer sightings since 1941: San Patricio Co., Welder Wildlife Refuge (July 24, 1955, and July 23, 1957, Clarence Cottam); Starr Co., Roma (2 circling over the town, Sept. 1, 1971, Archie D. Wood); Cameron Co., Boca Chica (Apr. 24, 1972, E. T. Masthay, et al.). *Winter*: Oct. to Feb. Formerly regular in Cameron Co.; last known specimen: Cameron Co., Morro Island (Dec. 20, 1921, collector unknown; skin examined by T. G. Pearson). Winter sightings since 1921: El Paso (Dec. 27, 1937, and Dec. 26, 1938, T. M. Kirksey); Brewster Co. (Mariscal Mine, Feb., 1952, K. Haller, Peter Koch; near Bullis Gap on Rio Grande, Nov. 26, 1971, E. C. Fritz); Cameron Co., Laguna Atascosa Nat. Wildlife Refuge (at least once during 1950's, L. C. Goldman); San Patricio Co., Welder Wildlife Refuge (Feb. 11, 1957, C. Cottam).

HAUNTS AND HABITS: The handsome Aplomado is a Latin American falcon which in the nineteenth and early twentieth centuries extended barely to the U.S. Southwest. Prime Aplomado habitat here was arid grassy plains scattered with mesquite, yucca, and cacti. Usually, present-day haunts are warmer and somewhat more humid than the former U.S. range. The senior editor in over forty years of birding in Texas has never seen this species within the state, but the two birds he watched in southernmost Tamaulipas in the 1950's were inhabiting what has been called lowland sub-humid tropics. One of these birds was perched on top of a Mexican fan palm (*Sabal mexicana*) south of Ciudad Mante and the other teetered on a telephone wire a few kilometers west of the Tampico marshes. The flat terrain in both locations supported partly cutover thorn scrub (*Acacia* and *Leucaena*) with an occasional strangler fig (*Ficus*), this latter plant being indicative of tropical, at least fairly humid, conditions. Neither scene contained any grass to speak of. Both of these Aplomado Falcons were so tame that they allowed a telescope to be set up and focused on them.

Flight is light, graceful, and swift; the bird usually flies low above the ground. When hunting, which it often does in pairs, it moves furtively in thickets and patches of trees along a stream; it also hunts in open places in true falcon manner. Chief foods are insects, small mammals, lizards, snakes. Occasionally, it overtakes and catches small birds in the air. In the vicinity

of Brownsville, Texas, the Aplomado Falcon has been observed hovering on the fringe of a grass fire where it snatched insects retreating from the flames. Since such fires are a regular event in Latin American portions of the species' range, this is undoubtedly a standard feeding method.

The Aplomado utters high-pitched cackles typical of falcons. Three individuals flying over a wash were heard repeatedly sounding shrill *eeek's* (L. Brown and D. Amadon).

CHANGES: The Aplomado Falcon is one bird whose near-demise in the United States (and also in Guatemala) cannot be blamed on hard use of hard pesticides, as this species staged its most drastic diminution between 1890 and 1910—long before any of the massively polluting poisons were released upon the world. Nor is it reasonable to suppose that overgrazing of grass or bulldozing of brush could have had much effect. If anything, the warming and drying of the Texas climate which took place during the first half of the twentieth century should have increased the population of this tropical dryland bird of semiopen terrain. It is curious to note that a nest of *Falco fusco-caerulescens* (as the Aplomado was then called) found seven miles from Fort Brown in Cameron County on June 16, 1877, had all three of its eggs rotten, but with well-developed embryos. A second nest found within one hundred yards of the first on May 7, 1878, contained two healthy eggs and one dead embryo (see J. C. Merrill, 1878, *Proceedings U.S. Nat. Mus.*, vol. 1, p. 152). Perhaps this falcon had a lethal gene or two even in the 1870's! In summary, none of the usual causes of bird decimation seem to apply to the Aplomado Falcon.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN APLOMADO FALCON, *Rhynchofalco femoralis septentrionalis* (Todd)

DESCRIPTION: *Adults, nuptial plumage (gray—normal—phase)*: Acquired by wear from winter plumage. Pileum deep neutral gray, becoming narrowly whitish or buffy on extreme forehead; narrow collar on hindneck cinnamon or cinnamon buff; remainder of upper surface neutral gray, upper tail-coverts deep neutral gray, barred and tipped with grayish white; tail fuscous black or chaetura black, becoming hair brown basally, broadly barred with white, grayish white, or buffy white; tips of primaries fuscous, becoming hair brown on secondaries, inner webs of both numerously barred with dull white, secondaries and inner primaries with broad tips of dull white; remainder of upper surface of wings like back; broad white or buffy white streak beginning above eye and extending to nape where it joins cinnamon collar; broad postocular stripe of deep neutral gray and conspicuous rictal stripe of same color, this separated by broad stripe of pale buff or buffy white; chin, throat, and jugulum buffy white or very pale buff; sides of body and narrow bar across breast chaetura drab or dark mouse gray, feathers narrowly tipped with dull white; abdomen cinnamon or cinnamon buff; thighs orange cinnamon, unbarred; lining of wing cinnamon buff or white, broadly barred, except near edge, with chaetura drab, dark mouse gray, or hair brown. Bill yellow at base, plumbeous on middle portion of maxilla, and fuscous or dull black at tip, cutting edges, with mastax, ocular region, and cere, orange-yellow, light yellow, or dark yellow; iris olive brown, dark hazel, or deep yellowish brown; legs and feet chrome yellow, orange-yellow, or light yellow; claws

black. *Adults, nuptial (cinnamon phase)*: Similar to gray phase, but breast and jugulum cinnamon or cinnamon buff, sides of head, nuchal collar, and anterior lower parts deeply cinnamon. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults in corresponding phase, but feathers of back and scapulars with light gray or light brown tips. *Third nuptial*: Acquired by wear from third winter. Similar to nuptial adults in corresponding phase, but upper parts darker, duller, and more brownish; jugulum with very narrow blackish or dark brown streaks. Tip of bill black, middle portion gray, base yellow; cere and bare skin about eye mustard yellow; iris wood brown; legs and feet primuline yellow; claws black. *Third winter*: Acquired by complete postnuptial molt. Similar to third nuptial in corresponding phase, but feathers of back and scapulars with tips or margins of light gray or light brown. *Second nuptial (gray phase)*: Acquired by wear from second winter. Similar to third nuptial in gray phase but darker and more brownish; jugulum much more heavily streaked. Pileum chaetura black or between hair brown and fuscous, edges of feathers paler; back light hair brown to light brownish drab, or fuscous and hair brown; remainder of upper surface fuscous to hair brown; lesser wing-coverts margined with russet, upper tail-coverts with ochraceous tawny and pale buff; tail feathers narrowly and irregularly barred with light buff and grayish or buffy white, tip of tail same color; primaries and secondaries more or less barred on inner webs with white and very pale buff, and secondaries and inner primaries broadly tipped with white; sides of neck like pileum; stripe on side of head above eye buffy white or pale buff; mustache chaetura black; auricular region, chin, throat, and jugulum cinnamon buff or buff, the last broadly streaked with fuscous; remainder of lower surface cinnamon and cinnamon buff; upper abdomen with broad streaks or spots of fuscous; sides of body fuscous, edged and spotted with dull white or pale buff; lining of wing cinnamon or cinnamon buff, with numerous bars of fuscous and hair brown. *Second nuptial (cinnamon phase)*: Differs from gray phase as does cinnamon phase in other plumages. *Second winter*: Acquired by complete postnuptial molt. Similar to second nuptial in corresponding phase. *First nuptial*: Acquired by wear from first winter. Similar to second nuptial, but upper surface much more brownish. *First winter* (juvenal plumage of most authors) *gray phase*: Acquired by complete postjuvenal molt. Like first nuptial but somewhat darker. Similar to adults in corresponding plumage, but entire upper parts buffy brown to hair brown instead of gray; upper tail-coverts broadly margined with ochraceous or tawny, light bars of tail buff or cinnamon buff; lesser wing-coverts much edged with russet; jugulum broadly streaked with fuscous; large areas on sides of body fuscous instead of dark mouse gray. *First winter (cinnamon phase)*: Similar to first winter gray phase, but light lower parts, sides of head and of neck, and collar around hindneck very much more deeply colored, becoming cinnamon buff or cinnamon; edges of feathers on upper parts, particularly back and upper tail-coverts, tawny or russet. *Juvenal* (second natal down of most authors): Unknown. *Natal*: Unknown.

MEASUREMENTS: *Adult male*: Wing, 247.9–267.0 (average, 257.0) mm.; tail, 173.0–193.0 (182.1); bill (culmen from cere), 16.0–18.0 (17.0); height of bill at base, 15.0–16.0 (15.5); tarsus, 48.0–52.1 (51.1); middle toe without claw, 35.1–38.1 (36.3). *Adult female*: Wing, 272.0–302.0 (290.3); tail, 192.0–207.0 (198.9); bill, 17.0–20.1 (19.0); height of bill, 16.5–18.5 (17.3); tarsus, 50.0–59.9 (55.6); middle toe, 38.1–41.9 (39.9).

RANGE: In the United States (at least formerly) from s.e. Arizona, s.w. New Mexico, and s.w. Texas, thence south through Mexico to Guatemala (rarely).

TEXAS: *Breeding*: Collected in Midland Co. (eggs, June 15, 1904, J. C. Burkett); Brewster Co., Alpine (July 28, 1890, W. Lloyd); Hidalgo Co., Hidalgo (eggs, Sept. 12, 1902, F. B. Armstrong); and Cameron Co. (numerous eggs and skins, 1877–1935). A female taken in Nueces Co., Corpus Christi (exact date unknown) for O. Salvin and F. D. Godman was apparently considered within this subspecies' 19th-century breeding range (see Salvin and Godman, 1897–1904, *Biologia*

Centrali-Americana, Aves, vol. 3, p. 118). *Winter*: Taken in Cameron Co. (14 specimens, 1881–1921).

NESTING: *Nest*: In brush or timber along streams, in yucca, bush, or low tree, sometimes in nest of a White-necked Raven; poorly constructed platform of twigs; lined with a few grasses. *Eggs*: 2–4, usually 3; ovate to oval; cream white, dull yellowish white, or pinkish white; heavily blotched and dotted with various shades of dark brown, reddish brown, and buff; average size, 45.0 × 35.1 mm.

PIGEON HAWK, *Aesalon columbarius* (Linnaeus)

SPECIES ACCOUNT

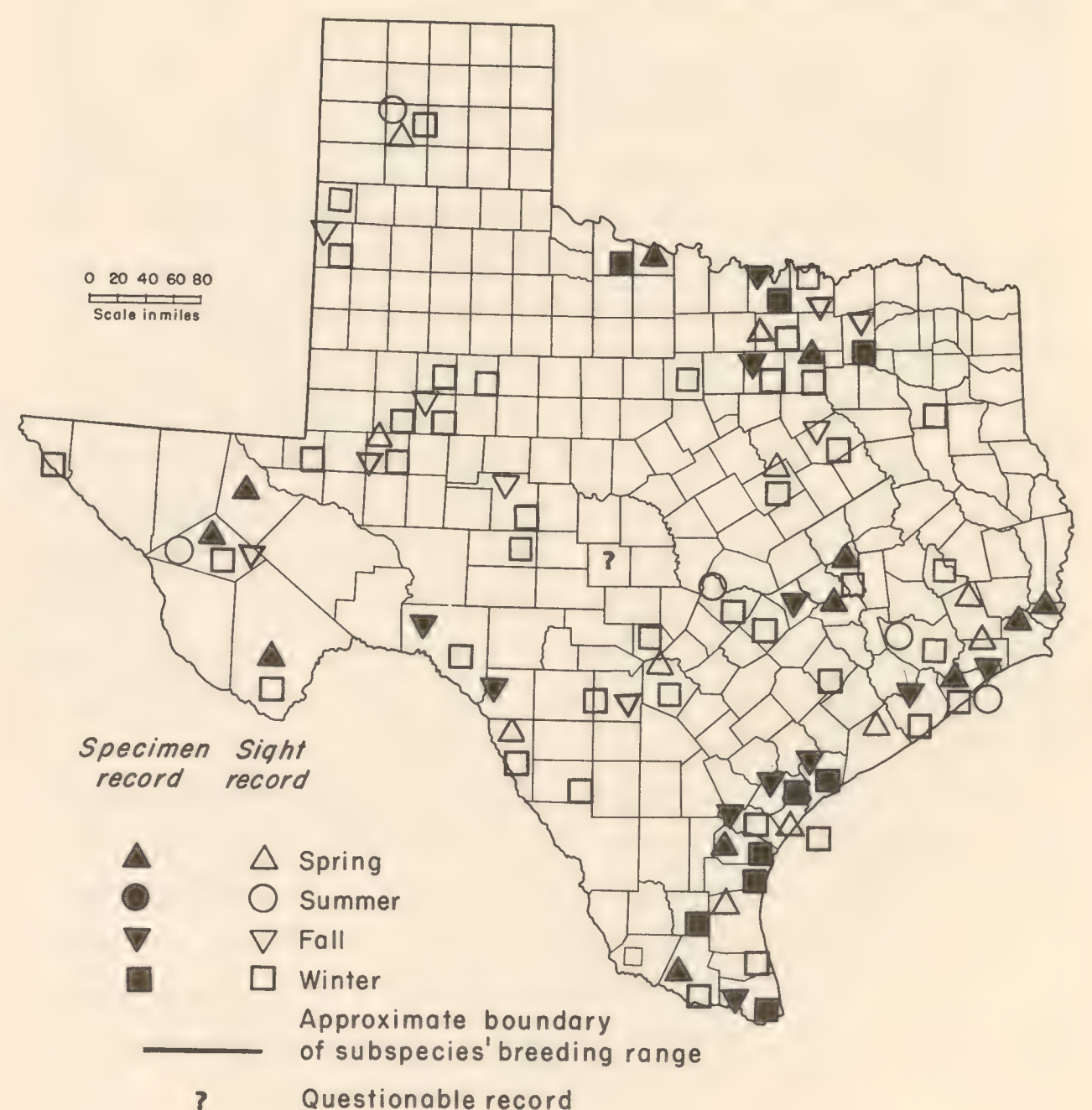
Falco columbarius of A.O.U. check-list, 1957 (see Appendix A). Merlin of British and some American authors. A small falcon, lacking a strong facial pattern but with indistinct buffy eyebrows. Uniformly bluish slate gray above (dark brown in female and immature); numerous broad black bands on whitish-tipped tail; buffy white on sides of neck and under parts, liberally streaked with dark rusty. Length, 11 in. (male), 12¾ (female); wingspan, 23¾ (male), 26½ (female); weight, 6 oz. (male), 8½ (female).

RANGE: Holarctic. Iceland, British Isles, Scandinavia, Russia, and n. North America, south to Kirghiz Steppes, Mongolia, Kamchatka Peninsula, n.w. United States, and s.e. Canada. Winters from southern portion of breeding range to n. Africa, Arabia, n. India, China, Japan, Peru, and Venezuela (including Trinidad); also West Indies.

TEXAS: (See map.) *Winter*: Early Sept. to early May (extremes: Aug. 14, May 30). Uncommon to rare over most of state; rare in Trans-Pecos.

HAUNTS AND HABITS: The Pigeon Hawk is a hardy, pigeon-sized, pigeon-eating falcon which breeds to

PIGEON HAWK, *Aesalon columbarius*



tree-limit in boreal spruce-fir forests of the Northern Hemisphere. It adapts its nest to a variety of situations: on a cliff ledge, in an abandoned crow or magpie nest in a deciduous or coniferous tree, in a natural tree cavity, a scrape on the ground, or a hole in a river or stream bank. Preferred hunting haunts are woodland openings and edges of lakes, rivers, ponds, and marshes; here the bird spends a good deal of time perched on a rocky outcrop or dead tree snag. Migratory movements of the small birds which it hunts often prompt this falcon's spring and fall journeys. Although of wider distribution, it is much less common than the American Kestrel. Increasingly seldom is it observed in parties.

Pigeon Hawk flight—quick powerful strokes on long pointed wings—is typical of falcons. That the Merlin successfully captures swifts and swallows attests to its agility on the wing. Small birds, such as sparrows and warblers, are standard prey, but it also takes larger birds—plovers, pigeons, flickers, and small grackles. Sometimes it stoops at Great-tailed Grackles, apparently without seriously attempting to catch them. It supplements its avian diet with a variety of insects—dragonflies, butterflies, grasshoppers, cicadas, others; also mice, shrews, pocket gophers, squirrels, bats, frogs, lizards, and snakes.

At the nest, the Pigeon Hawk sounds a loud, harsh, chattering *ki ki ki ki*, etc.; migrant and winter birds in Texas, as elsewhere, are usually silent.

CHANGES: Apparently the Pigeon Hawk has been slowly declining since at least 1900. S. W. Woodhouse in 1853 pronounced the species common through the territory that is now Oklahoma. After this year, few, if any, ornithologists have accused the Merlin of being common anywhere in the United States. At mid-twentieth century, Audubon Christmas Bird Counts indicate an ongoing subtle diminution. In Texas during the Christmas season of 1949, 5 out of a total of 17 counts found a total of 5 Pigeon Hawks; in 1955, 5 counts out of 24 reported 6 individuals; in 1960, 7 counts out of 37 reported 8 birds; in 1965, 6 counts out of 55 found 7 individuals; and in 1970, 6 counts out of 53 yielded 7 birds.

DETAILED ACCOUNT: THREE SUBSPECIES

EASTERN PIGEON HAWK, *Aesalon columbarius columbarius* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts deep neutral gray to light neutral gray, with conspicuous shaft streaks of dusky neutral gray or dull black; broad subterminal band on tail dull black, remaining portion chaetura black, broadly barred with light neutral gray which becomes white or grayish white on basal portion of inner webs of outer tail feathers, including conspicuous broad white tip on rectrices (altogether 4 or 5 of these light bars), primaries chaetura black or chaetura drab, inner webs barred or spotted with white, grayish white, or buffy white; exposed surface of wing neutral gray like back; secondaries chaetura drab or hair brown, inner webs barred or spotted with white except at tips; narrow, mostly concealed, collar of cinnamon buff on hindneck; ill-defined superciliary stripe dull buff; sides of head pale buff streaked with neutral

gray or chaetura drab; poorly defined rictal stripe of blackish streaks; middle of chin and of throat white or buffy white; remainder of lower surface, including lining of wing, cinnamon buff, cinnamon, or pale buff, broadly streaked and posteriorly also somewhat barred, with chaetura drab or deep neutral gray; thighs cinnamon or orange cinnamon streaked with fuscous or chaetura black. Bill terminally slate black, basal half plumbeous white; cere and corner of mouth chrome yellow or light greenish yellow; eyelids gamboge yellow to greenish yellow; bare orbital space yellow; iris vandyke brown; legs and feet gamboge yellow, wax yellow, deep cadmium, honey yellow, or greenish yellow; claws black. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter plumage. Similar to adult male but more brownish, upper parts rufescent hair brown to chaetura drab or brownish deep mouse gray, streaks on pileum dull black; subterminal band on tail chaetura black to fuscous; remainder of tail drab to hair brown with a few bars of grayish white and light pinkish buff; sides of head more brownish (less slate); lining of wing more rufescent. Tip of bill black, becoming dark brown basally, and greenish yellow on base of mandible; cere and eyelids gamboge yellow or yellowish green; iris dark brown; legs and feet cadmium or lemon yellow; claws black. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, first nuptial*: Acquired by wear from first winter, with which it is identical except for paleness due to fading. *Male and female, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adult female, but with whole head and lower surface more strongly rufescent, ochraceous, or cinnamon; feathers of upper parts with obscure russet or cinnamon edgings. Bill black, greenish at base; cere and eyelids light greenish yellow; iris dark brown; legs and feet light chrome yellow or medium cadmium.

MEASUREMENTS: *Adult male*: Wing, 182.1–199.9 (average, 189.2) mm.; tail, 114.0–128.0 (121.7); bill (culmen from cere), 10.9–13.0 (12.4); height of bill at base, 9.9–11.9 (11.2); tarsus, 35.1–40.9 (38.4); middle toe without claw, 28.9–31.0 (29.7). *Adult female*: Wing, 201.9–215.1 (208.0); tail, 130.0–140.0 (135.6); bill, 13.5–15.0 (14.2); height of bill, 11.4–12.4 (12.2); tarsus, 38.1–42.9 (40.1); middle toe, 29.9–36.1 (34.3).

RANGE: N. Manitoba to n. Labrador, south to Minnesota, n. Ohio, Maine, and Nova Scotia. Winters chiefly from s. Texas and Georgia through Mexico and Central America to Venezuela (including Trinidad), Colombia, Ecuador, and Peru; also West Indies.

TEXAS: *Winter*: Taken northwest to Wichita (Apr. 13), east to Hunt and Orange (Mar. 8), south to Cameron cos. Scarce.

WESTERN PIGEON HAWK, *Aesalon columbarius bendirei* (Swann)

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *A. c. columbarius*, but male lighter above; female lighter and more brownish above, with upper parts rufescent hair brown.

MEASUREMENTS: *Adult male*: Wing, 188.0–198.1 (average, 194.8) mm.; tail, 116.1–121.9 (117.9); bill (culmen from cere), 11.9–13.0 (12.4); height of bill at base, 10.9–11.7 (11.2); tarsus, 36.1–39.1 (36.8); middle toe without claw, 29.4–33.5 (31.2). *Adult female*: Wing, 207.0–217.9 (210.8); tail, 125.0–133.1 (127.8); bill, 13.5–15.5 (14.2); height of bill, 10.9–13.0 (11.7); tarsus, 37.6–40.9 (39.4); middle toe, 34.0–37.1 (35.8).

RANGE: N.w. Alaska and n. Mackenzie to n. Saskatchewan, south to British Columbia, n. California, Utah, and s.w. Colorado. Winters chiefly from California and Colorado to Baja California, Jalisco, Guanajuato, and Yucatán; also Cozumel Island.

TEXAS: *Winter*: Taken northwest to Wilbarger, east to Cooke, south to Brazoria (Oct. 27) and Cameron, west to Brewster (Apr. 20), Jeff Davis (Mar. 29), and Reeves (ca. May 20) cos. Scarce.

RICHARDSON'S PIGEON HAWK, *Aesalon columbarius richardsonii* (Ridgway)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *A. c. bendirei* but larger; tail with usually six light bands; upper parts of male paler, of female paler and more brownish; in female, top of head dull cinnamon, clay color, or sayal brown with narrow shaft streaks of fuscous; remainder of upper parts (both sexes) hair brown with much cinnamon and buff edgings; still more different in same respects from *A. c. columbarius*. Bill plumbeous, but yellowish olive buff or greenish at base and black at tip; cere and bare orbital area lemon yellow, Naples yellow, or greenish; iris prout brown; legs and feet dull green, maize yellow, or lemon yellow; claws black.

MEASUREMENTS: *Adult male:* Wing, 195.1–202.9 (average, 197.9) mm.; tail, 117.1–132.1 (124.0); bill (culmen from cere), 11.9–13.5 (12.4); height of bill at base, 10.4–11.4 (10.7); tarsus, 35.6–39.9 (37.3); middle toe without claw, 28.9–34.0 (30.7). *Adult female:* Wing, 210.1–228.1 (220.2); tail, 126.0–149.1 (137.2); bill, 13.5–15.0 (14.2); height of bill, 10.7–12.4 (11.7); tarsus, 38.1–41.9 (41.1); middle toe, 33.0–37.1 (35.3).

RANGE: S. Alberta to s.w. Manitoba, south to Montana and North Dakota. Winters from Wyoming and South Dakota to California, Arizona, New Mexico, and Texas, thence in Mexico to Sonora, Guerrero, Zacatecas, and Tamaulipas.

TEXAS: *Winter:* Two specimens: El Paso Co., El Paso (ca. 1852, J. H. Clark; U.S. Nat. Museum collection); Jefferson Co. (Mar. 9, 1885, collector unknown; Museum of Comparative Zoology collection, Cambridge, Mass.).

white throat and cheeks, the latter distinctly broken by two vertical black stripes; black spot on side of head posterior to stripes; black-barred rufous back; blue-gray wings becoming blackish on primaries; rufous tail with subterminal black band and white tip; variable buffy to russet below with black spots on breast and sides. *Female:* pileum and black-and-white facial marks as in male; black-barred brownish above; cinnamon-streaked pale buffy below. Length, 10 in. (male), 10¾ (female); wingspan, 22¼ (male), 23½ (female); weight, 3½ oz. (male), 4½ (female).

RANGE: C. Alaska to n.e. Manitoba and Nova Scotia, south through United States, Mexico, Central America, and South America (although largely absent from Amazonia and dense forests) to Tierra del Fuego; also West Indies and Islas Juan Fernandez (Chile). Winters from s. Canada through remainder of breeding range.

TEXAS: (See map.) *Breeding:* Early Mar. to early Aug. (eggs, Mar. 15 to July 15) from about 100—at least formerly—to 8,500 ft. Uncommon and local in northern Panhandle and Trans-Pecos; scarce along Red River to northeastern corner of state; rare and local in remainder of northern and western thirds (formerly fairly common over much of above mentioned areas); at least formerly, rare and irregular south through eastern two-thirds to about 30th parallel. *Winter:* Late Aug. to late Apr. (extremes: July 19, June 20). Common to fairly common throughout.

HAUNTS AND HABITS: *Tinnunculus sparverius* is a jay-sized falcon of open country and woodland edge. A common roadside raptor, the Sparrow Hawk finds ideal vantages on utility wires where it perches in characteristic round-shouldered posture, occasionally pumping its tail slightly. In some of the more northern states, it is drawn to cities and towns where an abundance of House Sparrows provide prey, wires offer lookouts, and buildings afford suitable crevices for nesting. Wintering throughout Texas, Sparrow Hawks return in late summer and early fall; nesting is rare and localized in the state—and getting more so. It migrates at times in loose flocks, is seen in pairs in spring and summer, but in winter is typically solitary.

Light and quick on the wing, this diminutive falcon skims above the ground at a moderate height. While it is flying about in search of prey, it frequently stops its forward progress to hover on rapidly beating wings; this action is also characteristic of the European Kestrel, *Falco tinnunculus*, which for centuries has been given the folk name “windhover.” The American Kestrel swoops down to snatch up any grasshopper, cricket, or other large insect, mouse or similar mammal, small bird, lizard, or tiny snake that it spies. Birds (sparrow species mainly) and mammals are largely wintertime food.

The Sparrow Hawk's shrill, rapid *killy killy killy* is commonly heard in Texas, even in winter. This call is usually delivered from the air. Some bird imitators, notably Addie Beacham of Paris, Texas, can simulate this sound to the extent of attracting a Sparrow Hawk,

SPARROW HAWK, *Tinnunculus sparverius* (Linnaeus)

SPECIES ACCOUNT

Falco sparverius of A.O.U. check-list, 1957 (see Appendix A). American Kestrel of many authors. The smallest and most numerous falcon of temperate North America. *Male:* blue-gray pileum with russet crown;

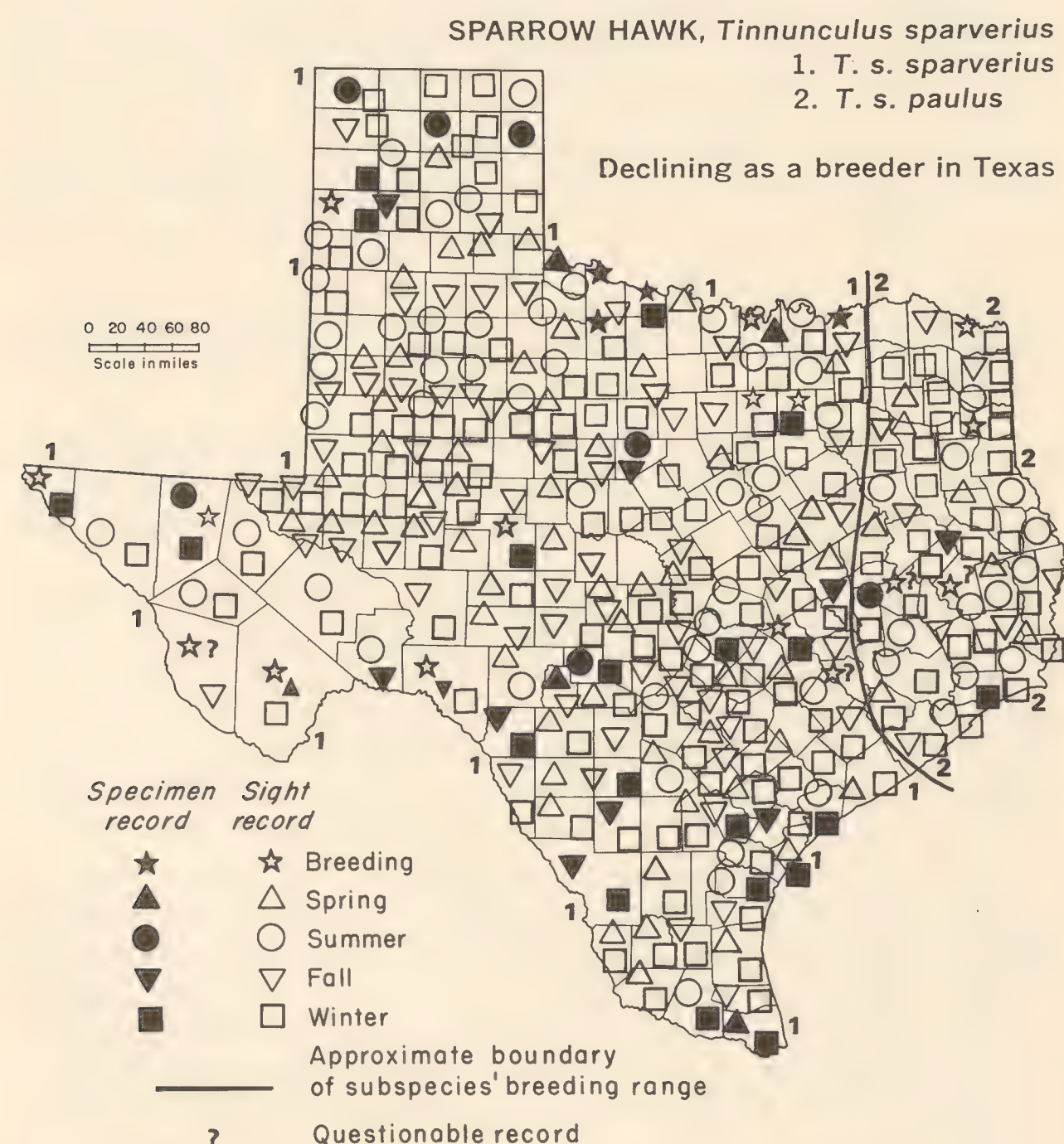




PLATE 8: Bald Eagle, *Haliaeetus leucocephalus*
immature (top), adult (bottom)



PLATE 9: Marsh Hawk, *Circus cyaneus*, in cattail (*Typha*) marsh
adult male (left), adult female (right)

which then circles around and around overhead answering the *killy's*.

CHANGES: The twentieth century is grim for birds of prey all over the world. Even *T. sparverius*, probably the most numerous raptor in temperate North America, is not exempt from the general decline. From 1900 to 1957, two apparent factors—gradual warming and drying of the Texas climate and reduction of tree-trunk nest holes—almost eliminated the Sparrow Hawk as a breeder in the state. Beginning in the 1950's, pesticides increasingly reduced migrant and winter individuals. The senior editor likes to recall 1928—the very last year it was possible for a sober naturalist to have any hope for the future. In that summer, the Davis Mountains of Trans-Pecos were cool. The peaks were pine-oak parklands with plenty of grass; apple orchards grew in the valley by rushing clear Limpia Creek. Summering Sparrow Hawks coursed frequently over both apples and pine-oak. By the summer of 1957, the Davis Mountains had changed from an oasis to a part of the surrounding desert. Limpia Creek had long been bone-dry, apples had vanished, and nearly all the big native trees, including even the drought-resistant alligator junipers (*Juniperus deppeana*) were dead. As a nesting bird, this falcon had vacated the dried and baked Davis Mountains.

In Texas during the 1960's and early 1970's, the Sparrow Hawk was still practically wiped out as a breeder and much reduced as a wintering species. It is only as a migrant that the bird seems nearly up to its old-time numbers. For example, in early October, 1969, and again in this month in 1971, over seventy of these little falcons in one day flew over the Austin residence of F. S. Webster, Jr.

DETAILED ACCOUNT: TWO SUBSPECIES

NORTHERN SPARROW HAWK, *Tinnunculus sparverius sparverius* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage (buff phase):* Acquired by wear from winter plumage. Pileum slate gray, extreme forehead whitish, crown with large central patch of russet or tawny; imperfect collar of black on hindneck; remainder of upper surface, including scapulars and tail, russet, tawny, or cinnamon, longest scapulars with light slate gray tips and conspicuous bars of black; tip of tail and outer web of outermost tail feather dull white or buffy white, broad subterminal band and a few spots which sometime become bars on outer rectrices dull black; wing-quills chaetura drab to chaetura black, inner webs except at tips with bars or spots of white; remainder of exposed surface of wing slate gray or light slate gray; wing-coverts with a few spots of black; large space on middle portion of outer secondaries chaetura black, forming conspicuous speculum in closed wing; inner webs of secondaries barred or spotted with white; narrow superciliary stripe and auricular region white or buffy white; vertical stripe behind auriculars dull black, another nearly vertical, partly diagonal stripe running backward from bill and eye of same color; dull black spot on cinnamon occiput; chin buffy white; remainder of lower surface light buff or buffy white, breast and sides thickly marked with roundish spots of dull black; lining of wing white or buffy white, spotted and barred rather strongly with hair brown or chaetura black. Bill bluish slate or slate black at tip, cinereous on middle portion, cinereous or yellowish white at base; cere and corner of mouth deep chrome,

yellow, pale orange, or orange-red; lower eyelid yellow or light orange; bare space in front of eye orange or chrome yellow; iris burnt umber or vandyke brown; legs and feet orange, orange-yellow, deep cadmium, or deep chrome; claws black. *Adult male, nuptial (cinnamon phase):* Similar to buff phase, but lower parts, particularly breast, jugulum, and abdomen, deep cinnamon, or between russet and ochraceous tawny. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male in corresponding phase but darker and more richly colored. *Adult female, nuptial:* Acquired by wear from winter. Similar to adult male in buff phase, but hindneck, back, scapulars, upper wing-coverts, rump, and tail barred with fuscous black or chaetura black and dull cinnamon, russet, and tawny; lower parts dull pale pinkish buff, cartridge buff, cream buff, or buffy white, broadly streaked with sepia or dull cinnamon, except on chin, upper throat, thighs, and crissum; bars and spots on inner webs of wing-quills mostly cinnamon or buff. Bill cinereous or dull light blue at base, changing through plumbeous on middle portion to black at tip; cere, lores, orbital region, and inside of mouth yellow or deep chrome; iris vandyke brown or hazel; legs and feet yellow or deep chrome; claws black. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female but darker. *Male, second nuptial:* Acquired by wear from second winter. Similar to nuptial adult male, but with more black spots on scapulars and lower parts, and with less tawny on tail. *Male, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial but somewhat more deeply colored. *Male, first nuptial:* Acquired by partial prenuptial molt and wear from first winter. Similar to second nuptial, but back conspicuously barred with black; breast heavily spotted with black; tail as in first winter. Bill dull grayish blue, but tip black; cere and eyelids orange; iris black or very dark brown; legs and feet orange. *Male, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adult male, but back numerously barred with dull black; jugulum conspicuously streaked with black; wing-coverts with faint tips of dull buff or buffy white. Legs, feet, and cere paler yellow. *Female, second nuptial:* Acquired by wear from second winter. Similar to nuptial adult female, but dark bars on back, scapulars, and lower parts narrower, and coloration somewhat darker. *Female, second winter:* Acquired by complete postnuptial molt. Coloration similar to that of second nuptial but rather darker. *Female, first nuptial:* Acquired by partial prenuptial molt and wear from first winter. Similar to second nuptial, but bars on upper and lower surface still broader, and colors darker. *Female, first winter:* Acquired by complete postjuvenal molt. Similar to nuptial adult female but darker and duller; bars on upper parts wider; lower parts more broadly streaked. Maxilla olive gray at tip, plumbeous on middle part and lilac gray at base; mandible pearl gray at base, but becoming pinkish white at tip; cere dull olive buff or yellow; orbital region light pearl gray or yellow; iris brown; legs cream color; feet pale naples yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by postnatal growth. Yellowish white above and below. *Natal:* Upper and lower surfaces white. Bill grayish flesh color; iris dark brown; legs and feet flesh color; claws light gray.

MEASUREMENTS: *Adult male:* Wing, 180.1–202.9 (average, 188.7) mm.; tail, 112.5–135.1 (121.7); bill (culmen from cere), 10.9–13.5 (11.9); height of bill at base, 8.6–10.9 (9.7); tarsus, 31.5–37.6 (35.6); middle toe without claw, 21.6–24.9 (23.4). *Adult female:* Wing, 185.4–207.0 (196.8); tail, 117.1–136.9 (128.3); bill, 10.9–13.5 (12.2); height of bill, 8.9–10.4 (9.7); tarsus, 33.0–38.1 (35.8); middle toe, 22.9–25.4 (23.6).

RANGE: C. Alaska to n.e. Manitoba and Nova Scotia, south in United States to s. California, n. (at least formerly c.) Texas, n. Alabama, and c. South Carolina, thence through n. Baja California and mainland Mexico to Guerrero and Veracruz. Winters chiefly from s. British Columbia, Nebraska, s.w. Quebec, Massachusetts, and Nova Scotia, through Mexico and Central America to Panama.

TEXAS: *Breeding:* Altitudinal range, 200 to 8,500 ft. Collected north to Hutchinson and Hemphill, east to Fannin, south to

Kerr, west to Val Verde, Brewster, and Culberson cos. Uncommon and local. *Winter*: Taken north to Oldham, east to Dallas and Chambers (Oct. 23), south to Calhoun and Cameron, west to Webb and El Paso cos. Common.

NESTING: *Nest*: In woodlands and, at least formerly, in orchards or in towns; in hollow of tree, abandoned woodpecker hole, occasionally in old nest of other bird, in cavity of rock, hole in bank, nook of building, or birdhouse; composed of grass, leaves, and rubbish; lined with grass and chips of decayed wood, when any lining is used. *Eggs*: 3–7, usually 4–5; rounded ovate to elliptical ovate, oval, or rounded ovate; white, cream buff, or reddish cinnamon; blotched and otherwise marked with different shades of brown and cinnamon, and with a few lavender shell markings; average size, 34.5×28.2 mm.

LITTLE SPARROW HAWK, *Tinnunculus sparverius paulus* (Howe and King)

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *T. s. sparverius* but considerably smaller; in male, dark

spots on lower surface confined mostly to sides of body, leaving middle of abdomen immaculate.

MEASUREMENTS: *Adult male*: Wing, 164.1–183.9 (average, 175.3) mm.; tail, 106.9–116.1 (112.0); bill (culmen from cere), 11.4–13.0 (12.2); height of bill at base, 8.9–10.9 (10.2); tarsus, 32.0–36.1 (34.3); middle toe without claw, 20.1–22.6 (21.4). *Adult female*: Wing, 172.0–187.5 (180.1); tail, 104.9–119.9 (110.7); bill, 11.4–13.0 (12.4); height of bill, 9.9–11.4 (10.4); tarsus, 32.0–36.1 (34.3); middle toe, 20.1–23.1 (21.9).

RANGE: C. Oklahoma and n.e. Texas to s.e. South Carolina, south to Florida. Casual in winter to s. Texas and c. Veracruz.

TEXAS: *Breeding*: Altitudinal range, probably about 100—at least formerly—to 700 ft. Collected in Smith (ca. 1832) and Grimes cos. Nesting pair assumed to be of this race found in Bowie Co., Oak Grove (Apr. 19, 1894, W. F. Cruzan). Scarce and local. *Winter*: Taken in Dallas (1 specimen), Chambers (1), and Aransas (1) cos. Probably uncommon.

NESTING: Similar to that of *T. s. sparverius*, but eggs somewhat smaller.

Guans: Cracidae

CHACHALACA, *Ortalis vetula* (Wagler)

SPECIES ACCOUNT

Eastern Chachalaca and Plain Chachalaca of some authors. A big, rakish, chickenlike bird with a long, dark-green-glossed tail that is broadly tipped with pale brown or whitish. Grayish to brownish olive above and on upper breast; light tawny olive on remaining under parts; has pinkish (red in nuptial male) bare skin on each side of chin. Length, 22½ in.; wingspan, 26; weight, 1-1½ lbs.

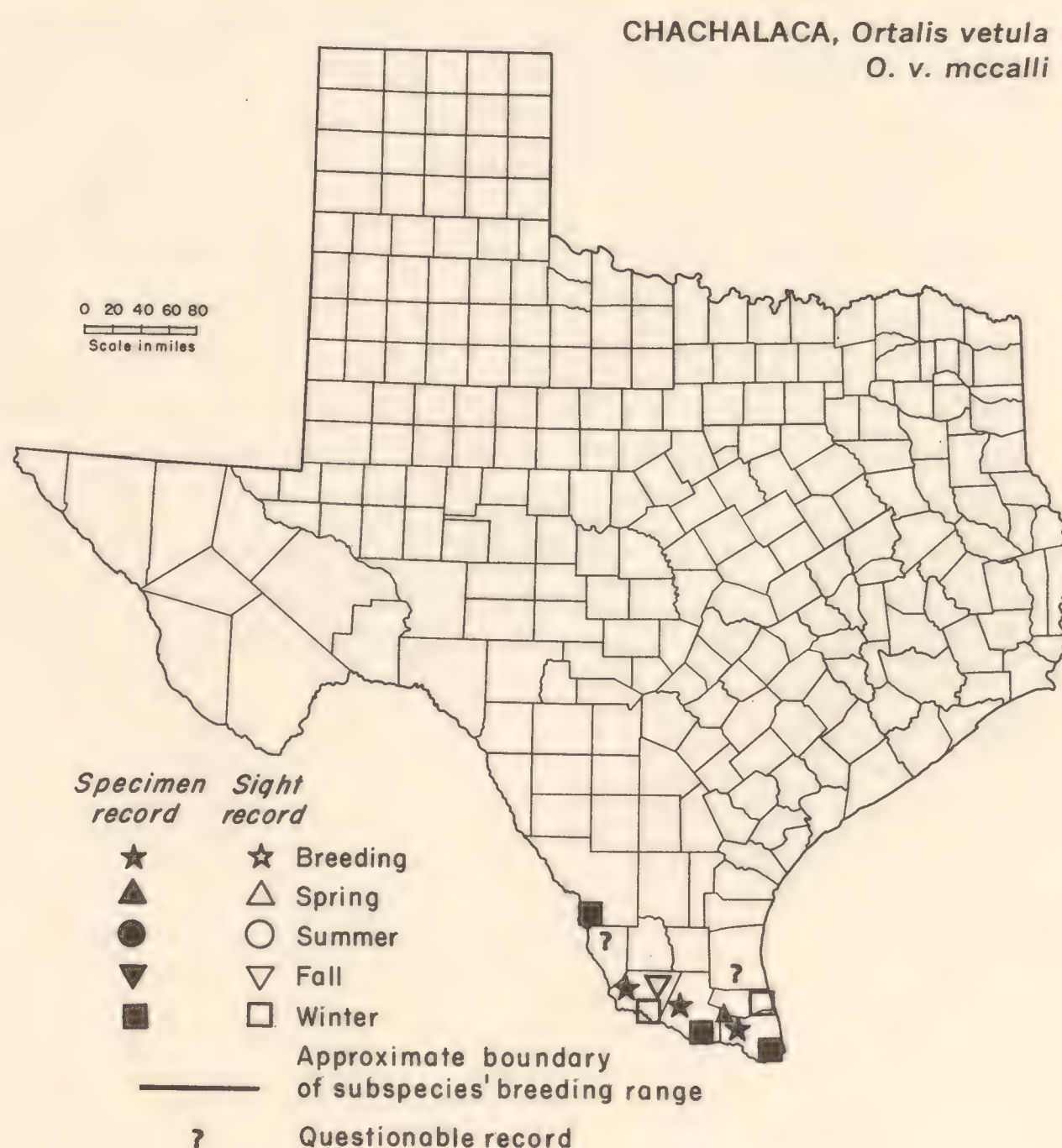
RANGE: Extreme s. Texas, south through lowlands of e., c., s.w., and s.e. Mexico to Guatemala, Honduras, Nicaragua, and n.w. Costa Rica. Birds on Pacific slope of Mexico and Central America have different territorial vocalization and may represent separate species.

TEXAS: (See map.) *Resident:* Breeds, early Mar. to Sept. (eggs, Mar. 21 to Aug. 16) from near sea level to about 300 ft. Locally common to uncommon along lower Rio Grande from Falcon Dam downriver to mouth. Formerly ranged at least occasionally upriver to Laredo (see detailed account), and regularly up-coast to Raymondville, perhaps sometimes to southern Kenedy Co. Restocked (early 1970's) in northern Hidalgo and southern Willacy cos.

HAUNTS AND HABITS: The thirty-eight members of Cracidae are large, often loud-voiced, forest and jungle birds. Only one of their ranks—the Chachalaca—ranges north of Mexico. Haunts and habits of this species are usual for those of its continental Latin American family, but among U.S. gallinaceous birds, native or naturalized, the Chachalaca is unique. Imagine a thicket-dwelling game bird so arboreal that it not only nests high in branches but also lines its nest with tree leaves! Even more curious to a Texas naturalist is that the Chachalaca brings an excellent example of tropical dueting and group vocalizing—so rare among Temperate Zone birds—to the sometimes frosty Rio Grande delta. *Ortalis vetula* dwells in dense remnant thickets of hackberry (*Celtis*), elms (*Ulmus*), willows (*Salix*), huisache (*Acacia farnesiana*), Texas ebony (*Pithecellobium flexicaule*), and mesquite (*Prosopis glandulosa*) that fringe Rio Grande arroyos and resacas from Falcon Dam to Brownsville, Texas. Seldom, except during the brief postnuptial period, do these birds wander farther than a mile from water.

Sufficient for a nonmigrant, Chachalaca flight is rather heavy and rarely sustained; although brief, it is swift and silent. The bird alights often in the upper part of a tree and moves to interior branches where it hops and walks about squirrellike as it feeds on berries (hackberries are relished), tender leaves and buds, and a few insects. The Chachalaca on occasion eats from the ground but it roosts in trees. Like most gallinaceous birds, it readily eats grain, especially cracked yellow corn. This species and the Green Jay are the chief eaters of corn and bread crumb handouts that are regularly placed in front of the main photographic blind at Santa Ana National Wildlife Refuge, Hidalgo County.

Where they are fed regularly by people, these birds tend to become absurdly tame—in marked contrast to hunted Chachalacas which are exceedingly wary and elusive. The senior editor recalls a hand-raised (chiefly on tortillas and cornmeal paste) bird he encountered during the 1950's at the Everts W. Storms Ranch along the Río Sabinas in southwestern Tamaulipas. This individual spent much time perched on his master's



shoulder while shouting its *cha-ca-lac*'s only a few inches from the man's ear. The poor fellow undoubtedly had damaged hearing! The Chachalaca would thus appear to make an ideal, though loud, domestic bird, except for one flaw: It practically never breeds in captivity.

The voice of the Chachalaca ranks with that of another group-territory proclaimer, the howler monkey, as great neotropical sound. In spring and summer, a male from a treetop vantage begins his strident *cha-ca-lac*; the female's call, quite similar to the male's, is a bit higher pitched and sounds to some listeners like *keep-it-up*. He or she, calling singly or in duet, in turn stimulates *cha-ca-lac*'s from other birds, whose separate vocalizations merge into a full-blown *cha-cha-laca* chorus. (On the Pacific slope of Mexico and Central America, birds in the breeding season—singly, in duet, or in chorus—sound a slow, rolling *cover-it-up*.) An early warning signal of *Ortalis vetula* is a low drawn-out *purrr-r-r-r*; the alarm note (sometimes also voiced as males fight) is a rapid series of harsh *kak-kak-kak*'s.

CHANGES: The various forms of *Ortalis* are noted for being as difficult to exterminate as are cottontail rabbits. Unlike their cousins, the curassows and guans, chachalacas do not require virgin forest. Just so long as a few good second-, third-, fourth-, or even fifth-growth thickets remain in a not overly poisoned landscape, *Ortalis* can survive. However, the Rio Grande delta in both Texas and Mexico was over 90 percent cleared by 1970. In addition, pesticide and herbicide concentrations in delta soil, water, and air are fantastically high. During the 1950's, native Chachalacas disappeared from the vicinity of Raymondville and the other parts of southern Willacy County, according to Rucker Stanford, a long-time rancher and farmer in this area.

Currently (early 1970's), *Ortalis vetula* is confined chiefly to willow and mesquite thickets on the banks of the Rio Grande in Starr County, and in woods and brush of Bentsen-Rio Grande Valley State Park, Santa Ana National Wildlife Refuge, and two tracts leased by the World Wildlife Fund—Anzalduas and Santa Maria—all in Hidalgo County. A few Chachalacas still cling to the highly cut-up remnants of native Texas palm (*Sabal texana*) on Texas' southernmost square mile in Cameron County. The Longoria tract, two hundred acres of native brush north of Santa Rosa in Cameron County, was stocked with 20 Chachalacas by Texas Parks and Wildlife Department during the winter of 1959-60. These birds were reported as "thriving" in

1969. By 1972, several hundred Chachalacas had been transplanted from Longoria to sites in upper Hidalgo and lower Willacy counties (P. B. Uzzell, fide F. S. Webster, Jr.).

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN CHACHALACA, *Ortalis vetula mcalli* (Baird)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Pileum mouse gray, darker on occiput; rest of upper parts including wings deep olive, more grayish anteriorly; tail dark olive with metallic dark greenish black or purplish black sheen, middle feathers more brownish, and with broad brownish white tip except on two middle feathers; primaries olive brown, remaining surface of wings like back; sides of head and of throat like pileum but rather more brownish; middle line of throat blackish; jugulum dull citrine drab; remainder of lower parts dull light tawny olive; crissum, sides, and flanks saccardo umber; lining of wing dull orange cinnamon or cinnamon, edge of wing light olive brown. Bill and feet plumbeous; bare skin on each side of chin dull flesh color, red in male during nuptial season; iris dark brown. *Adults, winter:* Acquired by complete postnuptial molt. Essentially identical with nuptial adults. *First nuptial:* Acquired by wear from first winter. Identical with nuptial adults. *First winter:* Acquired by complete postjuvenile molt. Practically identical with adults in winter. *Juvenal:* Acquired by complete postnatal molt. Similar to adults, but back and wing-quills somewhat duller and more brownish above, more or less mottled, sometimes rather obscurely, with dull buffy brown; upper tail-coverts olive brown or buffy brown; tip of tail dull sayal brown; lower parts more brownish, abdomen cinnamon buff; crissum buckthorn brown. *Natal:* Middle of crown black; hindneck clove brown; back mixed with clove brown, dull black, and auburn, with two irregular and mottled stripes of pinkish buff; sides of head pale smoke gray mixed with blackish; sides of neck mixed clove brown, sepia, cinnamon, and cinnamon buff; breast dull cinnamon buff; remainder of lower surface dull white.

MEASUREMENTS: *Adult male:* Wing, 205.0-214.1 (average, 210.8) mm.; tail, 229.1-259.1 (241.8); bill (exposed culmen), 21.1-25.4 (23.6); height of bill at base, 10.9-13.5 (12.2); tarsus, 61.0-68.1 (64.8); middle toe without claw, 47.0-52.1 (48.3). *Adult female:* Wing, 186.2-199.9 (193.5); tail, 208.0-229.1 (221.2); bill, 19.6-23.1 (21.4); height of bill, 8.9-11.9 (10.7); tarsus, 58.4-62.0 (59.7); middle toe, 42.9-47.5 (45.2).

RANGE: Lower Rio Grande Valley of Texas, south to Nuevo León, Tamaulipas, s.e. San Luis Potosí, and extreme n. Veracruz.

TEXAS: *Resident:* Collected in Starr, Hidalgo, and Cameron cos. Two specimens from Webb Co., Laredo (Jan. 14, 19, 1886, C. Jefferys).

NESTING: *Nest:* In brush or timber along streams; in bush or tree, often between 5 and 10 ft. from the ground; ordinarily small and loosely constructed platform; composed of sticks, grass, leaves, and Spanishmoss; lined with a few green leaves. *Eggs:* 2-5, usually 3; ovate, short ovate to elongate ovate; dull white to buffy white; surface granulated but unmarked; average size, 58.2 × 40.6 mm.

Grouse: Tetraonidae

GREATER PRAIRIE CHICKEN, *Tympanuchus cupido* (Linnaeus)

SPECIES ACCOUNT

See colorplate 10

Also known as Pinnated Grouse; extinct race in n.e. United States was called Heath Hen. A medium-sized, plump grouse of tall-grass prairies. *Male*: brownish, strongly black-barred above, on neck, breast, and belly; long winglike tufts (pinnates) on sides of neck; short rounded blackish tail. In display, erects pinnates; reveals orangish bare skin over eye; inflates bright golden air sacs on sides of neck; and cocks tail to reveal unbarred buffy crissum. *Female*: paler; pinnates short or rudimentary; tail and crissum with buffy barring. Length, 17¾ in.; wingspan, 28; weight, 2 lbs.

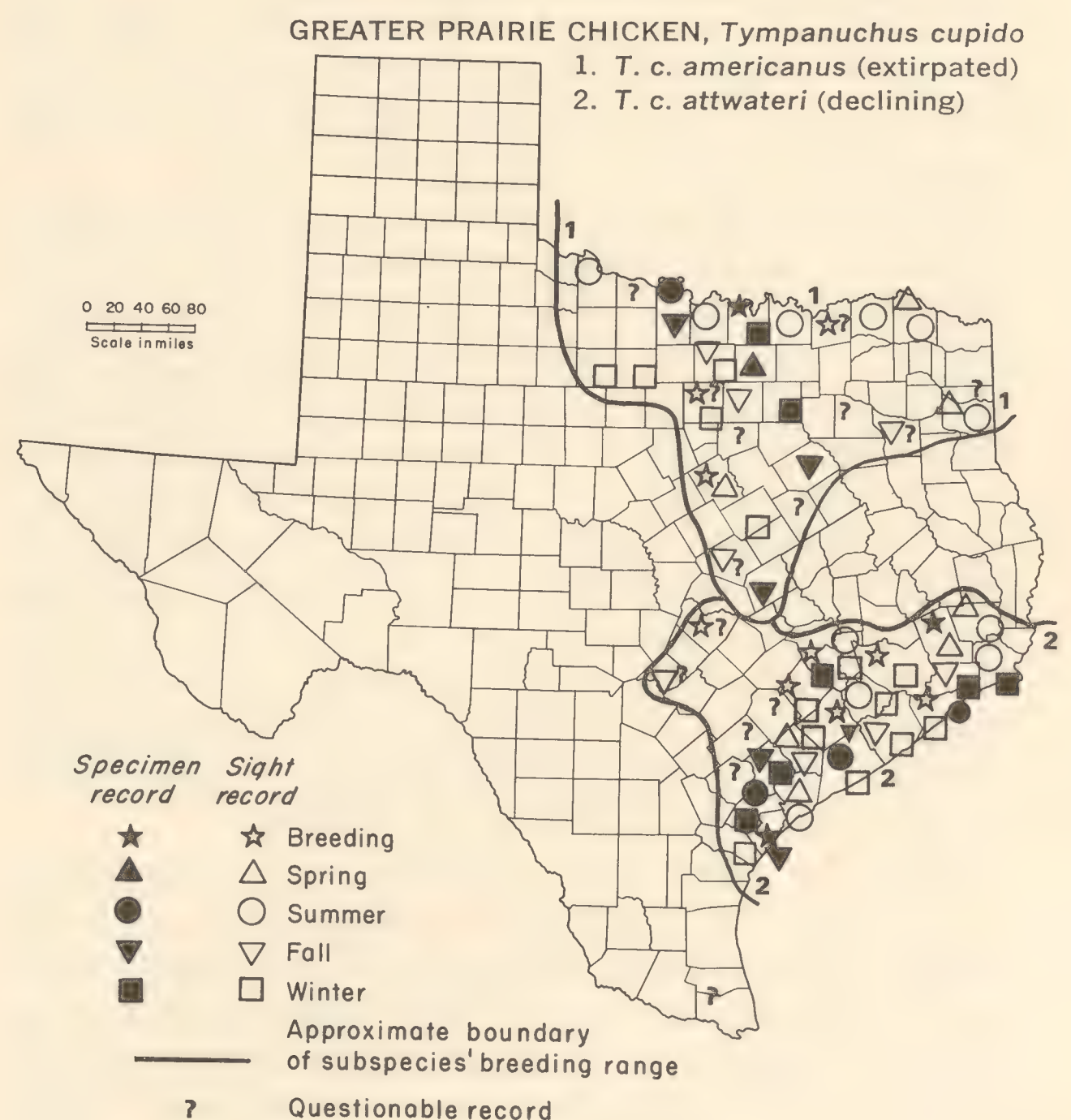
RANGE: Very locally from s.e. Saskatchewan and n. Michigan, south to n.e. Colorado, Kansas, n.e. Oklahoma, s. Illinois, and s.w. Indiana, also coastal prairie of s.e. Texas; formerly Alberta, n.e. United States, Kentucky, Tennessee, n.e. Texas, and s.w. Louisiana.

TEXAS: (See map.) *Resident*: Breeds, Feb. to July (eggs, Feb. 24 to June 29; young barely able to fly as late as June 15) from near sea level to about 200 ft.—formerly 1,200 ft. Currently (1972) scarce and increasingly local near coast from Harris and Galveston cos. southwest to Colorado, Refugio, and Aransas cos. Formerly (19th century) very common to fairly common in above range; locally common in Chambers, Jefferson, and Orange counties. Population extirpated in north central portion (this race formerly ranged east to Harrison Co., south to Bell Co.).

HAUNTS AND HABITS: The Greater Prairie Chicken is one of two Texas members of the Tetraonidae, whose Northern Hemisphere family numbers eighteen species. Most grouse are such cold-country birds that the Attwater's Greater Prairie Chicken, itself no stranger to frost, is the southernmost grouse in the world. The Greater seeks open prairies with a few weeds and patches of bare ground but mostly thick with tall grass—ideally one to three feet in height—which provides adequate roosting and nesting coverage. Nowadays, expanses of such grasslands rarely go ungrazed or uncultivated; thus, the northern race, *T. c. americanus*, is extirpated in its range in the prairies of north central Texas, and the status of the smaller *T. c. attwateri* on the Gulf coast is extremely precarious.

Flight, strong but not protracted, is seldom indulged in except when the prairie chicken is suddenly surprised. Individuals or flocks flush with heavy whirring of wings; after birds have risen about ten to twenty feet, they level off and alternately flap and sail for forty to seventy yards, then drop again into the grass. When flying away, prairie chickens suggest giant meadowlarks except for the blackish, instead of whitish, outer tail feathers. Like most grouse, the present species is largely terrestrial and essentially nonmigratory. However, in the northern states, birds—apparently only females—make regular southward flights in winter; also, fluctuating food supplies stimulate localized wandering. Seasons determine the bird's diet: In summer, tender leaves of various clovers and similar plants, seeds of grasses, sedges, and weeds, wild fruit, and insects (especially grasshoppers and locusts) are consumed; from fall into winter, the Greater Prairie Chicken sustains itself in large part on waste grain of oats, corn, wheat, sorghum, and rye.

With the first warm days of late winter, males, usual-



ly about ten to thirty of them, move to a communal display ground—either a patch of short grass one to two inches high or bare ground. In the old days, such cleared areas were created about watering places and salt licks by the American bison; they are made by cattle in the twentieth century. At dawn and dusk, males dance, boom, and spar. Frenzied birds space themselves about ten yards apart. Each cock inflates the golden air sacs on his neck, erects and spreads his tail, and raises the neck-tufts as he stamps madly on the ground, booms loudly, springs and whirls in the air, and intermittently charges his neighboring rivals. Usually one or two dominant males mate with most of the hens which are attracted to the edge of the display ground. Females attend to all nesting and brooding activities after which they gather in hen parties; likewise, males convene in separate postnuptial flocks.

Greater Prairie Chickens at all seasons exchange a variety of clucks and cackles. A displaying male, aided by his ballooning air sacs, booms a far-carrying *oo-loo-woo* which sounds like the noise produced by blowing across the top of an empty bottle.

CHANGES: Ever since the white man first encountered the Greater Prairie Chicken, he has persisted in his efforts to exterminate it. During the twentieth century, direct slaughter has abated, but habitat destruction continues as Americans proceed to convert virtually every square mile of their country into highways, hamburger stands, and beer joints.

First to go was the Eastern Greater Prairie Chicken, usually termed the Heath Hen, *T. c. cupido*. Extirpated on the northeastern U.S. mainland in 1835, a protected (from hunting), inbred colony existed into the 1920's on Martha's Vineyard off the Massachusetts coast. Fire in May, 1916, followed by a hard winter with a prodigious flight of Goshawks, broke the back of this colony. The few survivors were mostly killed off in 1920, apparently by blackhead disease from imported turkeys. A living Heath Hen was last reported with certainty on March 11, 1932.

No attempt whatever was made to save the north central Texas population (which possibly numbered 500,000 birds circa 1850) of the Northern Greater Prairie Chicken, *T. c. americanus*. Between 1870 and 1890, these birds were shot by the wagon load for meat and blood sport; even worse was the plowing up or overgrazing of their grassland habitat. The Northern Greater flickered out in Wilbarger County in 1907 (R. L. More); near Corsicana in Navarro County on November 14, 1900 (12 shot by hunters); and near Marshall in Harrison County when the last small flock disappeared after June, 1920 (A. R. Cahn). There is one incredibly late sighting in the vicinity of Tyler, Smith County, November 8, 1956 (J. M. Walker).

Along the Texas coast, the Attwater's Greater Prairie Chicken, *T. c. attwateri*, was slaughtered with customary frontier abandon between 1870 and 1900. Competitive shoots with up to fifty contestants were regarded as great fun. Sometimes downed birds were eaten or sold; upon other occasions they were left to

rot. For *attwateri*, as for other races, plowing under of the native sod was even more damaging than gunshots. Where overgrazing by livestock weakened the turf, huisache (*Acacia farnesiana*), mesquites (*Prosopis*), retama (*Parkinsonia aculeata*), and other brush encroached, reducing the acreage suitable for this prairie chicken. As of about 1880, the Attwater's was still generally distributed over the Texas coastal prairie from Colorado, Austin, Waller, and Harris counties in the north to Orange and Jefferson counties in the east (plus Cameron and Calcasieu parishes in Louisiana), thence southwest to Goliad, Bee, San Patricio, and Refugio counties—some 810,000 birds, according to V. W. Lehmann in his *Attwater's Prairie Chicken, Its Life History and Management* (1941, North American Fauna, no. 57). By 1937, the occupied area had shrunk to disjunct colonies within the area outlined above; at this time Lehmann determined that there were only about 8,700 *attwateri* in Texas—and in the world, since the last Louisiana record was on February 26, 1919.

According to biologists of the Texas Parks and Wildlife Department, there were 1,440 Attwater's Greater Prairie Chickens in 1970; 2,212 birds in 1971; and 1,650 in 1972. In these three late years the only healthy concentrations were located in Austin, Colorado, Goliad, Refugio (the very best county, according to state wildlife biologists W. C. Brownlee and R. W. Jurries), Victoria, and Wharton counties, but there were a few remnant birds in Brazoria, Calhoun, De Witt, Galveston, Harris, Fort Bend, and Waller counties. Counties abandoned since 1937 are Chambers, Jefferson, Lavaca, and Matagorda. Two new (as of 1972) Attwater sanctuaries should slow the rate of decline. One is the World Wildlife Fund's 3,450-acre tract near Eagle Lake in Colorado County; the other is a 7,000-acre (of which 3,000 is good-to-fair prairie chicken habitat) extension of Aransas National Wildlife Refuge in Refugio County. It is becoming increasingly apparent that the Attwater's "Martha's Vineyard" will be Refugio County. The soil of Refugio is mostly very low lying and salty. This condition has discouraged both the conversion of its grasslands into cotton, rice, and sorghum fields and the invasion of mesquite and other brush. *Attwateri*, in addition to being the southernmost grouse, is also the only one which lives under near-salt-marsh conditions. With careful protection and lots of luck, it is just barely possible that a few of these salty grouse may live to the dawning of the twenty-first century.

DETAILED ACCOUNT: TWO SUBSPECIES

NORTHERN GREATER PRAIRIE CHICKEN, *Tympanuchus cupido americanus* (Reichenbach)

T. c. pinnatus of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: Adult male, nuptial plumage (brown—normal—phase): Acquired by partial prenuptial molt and wear from winter plumage. Crown fuscous black or dull black, feathers tipped with dull buffy white or pale buff; remainder of upper surface dull black, fuscous black, or fuscous, all feathers with bars of isabella color, tawny, russet, cinnamon, cinnamon buff, orange cinnamon or pale buff, these broadest and most regular on

lower neck and middle of back, more broken and irregular posteriorly; tail fuscous to hair brown with dull white tip but otherwise unbarred, though middle feathers mottled with tawny or buff mostly on basal portion; wing-quills drab, shafts fuscous, barred on outer webs with pale buff, inner secondaries barred on both webs; primary coverts like primaries, remaining wing-coverts like back; on each side of neck a tuft of long, rounded, stiffened feathers, clove brown to dull black, their inner webs basally tawny with broad buffy white or cream buff shaft streaks that broaden terminally; lores mostly buffy white; small spot in front of eye bister, and broad rictal streak connecting with postocular streak of same color; remainder of sides of head and of neck pale buff, mixed with white and fuscous; broad malar streak composed of fuscous spots edged with dull white; chin and upper throat pale buff or buffy white; jugulum chestnut or auburn streaked with white or buffy white and barred posteriorly with same; remaining lower parts dull white or buffy white, laterally cinnamon or cinnamon buff, broadly barred, except on abdomen and crissum, with brown—between olive brown and fuscous and between fuscous and hair brown; lining of wing and axillars mostly white, outer under wing-coverts barred and spotted with light hair brown. Bill dark brown, or maxilla isabella color and mandible fawn color; bare skin above eye orange or orange ochraceous; bare air sacs on side of neck yellow, light red, or orange ochraceous; iris russet, light brown, or dark brown; feet dull yellow or tawny olive, but joints drab; claws seal brown. *Adult male, nuptial (rufous phase)*: Similar to brown phase, but upper parts everywhere deeply tinged with reddish brown; lower parts, except throat, chin, and crissum, dull chestnut with relatively few markings. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adult male but darker and more richly colored. *Adult female, nuptial (brown—normal—phase)*: Acquired by partial prenuptial molt and wear from winter. Similar to brown phase of nuptial adult male but smaller; has much shorter, even rudimentary, neck-tufts; tail strongly barred with buffy white, dull buff, or dull tawny, at least on outer webs of rectrices; lower tail-coverts also similarly barred; bars and edgings of jugulum and neck-tufts lighter. *Adult female, nuptial (rufous phase)*: Similar to brown phase of nuptial adult female, but light markings of upper parts rufous; lower surface mostly reddish brown or chestnut, sometimes almost uniform. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adult female but somewhat more richly colored. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, except for outermost two primary coverts and outermost two primaries in each wing retained from juvenal, the latter pointed, instead of more or less rounded, at tips; general plumage more rufescent. *Male, first winter*: Acquired by postjuvenal molt, complete except for retained outermost two primary coverts and outermost two pointed primaries of each wing. Similar to first nuptial male but more richly colored. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to adult female, except for retained outermost two primary coverts and pointed, instead of rounded, outermost two primaries on each wing. *Female, first winter*: Acquired by postjuvenal molt, complete excepting outermost two primary coverts and outermost two primaries of each wing. Similar to first nuptial female but more richly colored. *Juvenal*: Acquired by complete postnatal molt. Much like adult female, but neck-tufts lacking; upper parts dull buffy brown with broad shaft streaks of buffy white and mottled with darker brown; tail between clove brown and fuscous black, narrowly and numerously barred with buff and sayal brown; wing-quills drab, outer webs barred or spotted with dull white or pale buff; top of head light hazel with irregular central stripe or spot of brownish black; ear-coverts with small blackish spot; lower parts buffy white with irregular broad bars of hair brown or fuscous; jugulum mixed with cinnamon. Maxilla mummy brown or cinnamon; mandible cream buff or ecru drab; iris raw umber or drab gray; legs dull maize yellow; toes and claws on upper side yellowish broccoli brown or brownish chrome yellow; toes and claws below maize yellow or brownish chrome yellow. *Natal*:

Pileum cinnamon rufous with several spots of black; nape dull honey yellow; back mixed with black, hazel, and ochraceous tawny; chin and sides of head dull mustard yellow, throat naples yellow; band across jugulum bright ochraceous tawny; remainder of lower surface dull mustard yellow. Basal portion of culmen dull black; base of maxilla pecan brown, tip lighter brown; mandible pale flesh color, tip straw yellow; iris dark quaker drab; bare hind part of tarsus yellowish citrine; superior surface of toes honey yellow or mustard yellow; claws flesh color.

MEASUREMENTS: *Adult male*: Wing, 216.9–241.0 (average, 226.1) mm.; tail, 89.9–103.1 (96.3); bill (exposed culmen), 16.0–21.1 (18.8); height of bill at base, 9.4–13.5 (11.2); tarsus, 46.5–55.1 (49.8); middle toe without claw, 42.9–47.0 (45.0). *Adult female*: Wing, 208.0–220.0 (218.9); tail, 85.1–93.5 (90.2); bill, 17.0–19.6 (18.8); height of bill, 9.9–11.9 (11.2); tarsus, 46.0–52.1 (49.3); middle toe, 40.9–44.4 (42.9).

RANGE: Very locally from s.e. Saskatchewan and n. Michigan, south to n.e. Colorado, Kansas, n.e. Oklahoma, and s.w. Indiana; formerly in Iowa, n.e. Texas, Ohio, n.w. Kentucky, and Tennessee.

TEXAS: *Resident* (extirpated): Altitudinal breeding range, about 300 to 1,200 ft. Collected in Cooke, Denton, and Dallas cos. Shot by hunters in Wichita, Clay, Lamar, Navarro, and Milam cos. Common during 19th century.

NESTING: *Nest*: On plains or prairies; in grass or under bush; in slight depression lined with grass, weed stalks, and a few feathers. *Eggs*: 7–21, usually 11–14; oval to ovate; buff or olive buff, light drab or cream color; finely dotted with brown; average size, 44.7 × 33.8 mm.

ATTWATER'S GREATER PRAIRIE CHICKEN, *Tympanuchus cupido attwateri* Bendire

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *T. c. americanus* but smaller; feathering of tarsus somewhat shorter and sometimes leaving lower half of leg bare; coloration somewhat more rufescent and buffy, particularly on flanks and other lower parts; dark bars on lower surface usually narrower.

MEASUREMENTS: *Adult male*: Wing, 201.9–215.1 (average, 209.0) mm.; tail, 84.1–89.9 (87.6); bill (exposed culmen), 18.0–21.1 (19.6); height of bill at base, 10.9–12.4 (11.9); tarsus, 50.0–52.1 (51.1); middle toe without claw, 43.9–46.0 (44.7). *Adult female*: Wing, 195.1–206.0 (201.9); tail, 78.0–83.1 (80.7); bill, 17.0–20.1 (18.3); height of bill, 10.9–11.4 (11.2); tarsus, 47.0–50.0 (49.0); middle toe, 41.9–46.0 (43.2).

RANGE: Locally on central and upper coastal prairie of Texas; formerly to e. central Texas and s.w. Louisiana.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to about 200 ft.—formerly 700 ft. Collected in Orange (1885), Jefferson, Liberty (eggs), Chambers (specimen?), Galveston, Austin, Colorado, Wharton, Matagorda, Victoria, Refugio, and Aransas cos. Scarce and local. Birds thought to be of this subspecies formerly ranged north to Bastrop Co., Elgin (extirpated by Sept., 1902, fide H. C. Oberholser), and Travis Co., Pflugerville (nest and eggs found and last birds seen, spring of 1878, O. Brinkman). Sighted in 1877: 30 mi. north of Brownsville on the Miradores Ranch, Cameron-Willacy cos. (J. C. Merrill).

NESTING: Similar to that of *T. c. americanus*, but average egg size, 42.3 × 31.4 mm.

LESSER PRAIRIE CHICKEN, *Tympanuchus pallidicinctus* (Ridgway)

SPECIES ACCOUNT

Somewhat smaller and paler (due to brown, instead of blackish, bars on body) than the Greater Prairie Chicken; best distinguished by its habitat: semiarid rangeland (not humid tall-grass prairies). In display,

male inflates dull red (not golden) air sacs. Length, 16¼ in.; wingspan, 27¼; weight, 1¾ lbs.

RANGE: Very locally from s.e. Colorado and w. Kansas to n.w. Oklahoma, s.e. New Mexico, and n. Texas; formerly to Nebraska, s.e. Kansas, and s. Missouri.

TEXAS: (See map.) *Breeding:* Apr. to June (no egg dates available, but many young observed at Canadian, Hemphill Co., 1926, J. H. Wise; young bird located at Amarillo on June 13, 1938, Dean Amadon; most recently reported breeding in Gaines Co., 1960's, fide Anne LeSassier) from 1,800 to about 4,000 ft., possibly somewhat higher. Very locally fairly common to scarce from Apr. to Oct. in northern Panhandle (chiefly Hemphill and Potter cos.) and in southwestern Panhandle (chiefly Cochran, Yoakum, and Gaines cos.). Formerly (19th century) common south to San Angelo (resident and bred, fide W. Lloyd). *Winter:* Late Oct. to early Apr. Locally common to uncommon in and near breeding range; rare to casual in Midland vicinity. Formerly (19th century) very common to common in Panhandle, southward to Jeff Davis, Pecos, Maverick, and Banderita cos.; scarce eastward to Cooke Co. (see detailed account).

HAUNTS AND HABITS: *Tympanuchus pallidicinctus* is a smaller, paler, less booming version of the Greater Prairie Chicken. It is best told from its somewhat larger relative by its habitat requirements. The bird's narrow hold in the world is confined to sandy rangeland interspersed with sand sagebrush (*Artemisia filifolia*) and sand shinnery oak (*Quercus havardii*). Grass seems to be less necessary to this species than to the Greater Prairie Chicken, but often some bunch grass, such as little bluestem (*Andropogon scoparius*), is present in the Lesser's habitat.

In behavioral respects, the present species is very

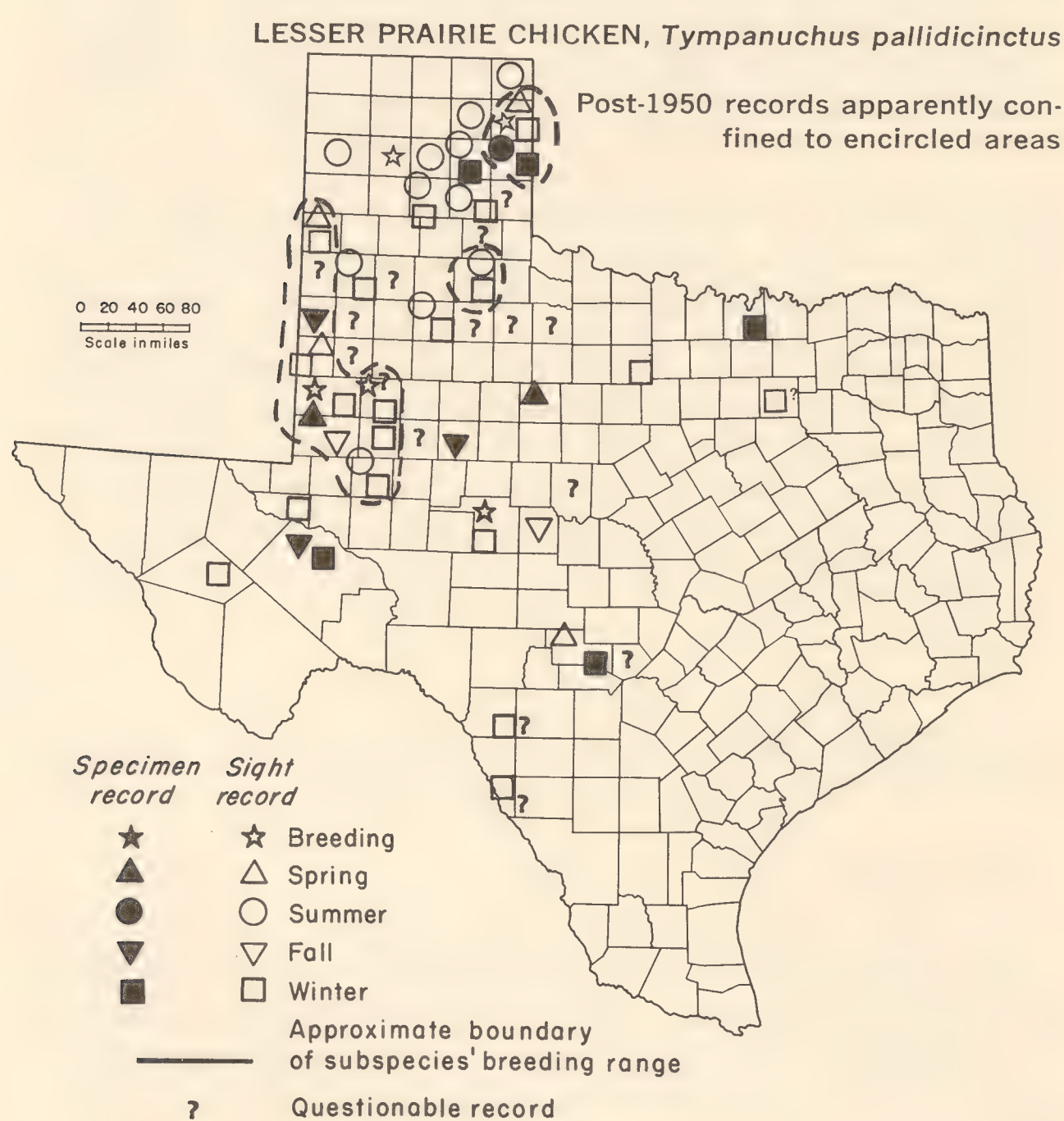
similar to the Greater. Flight of this mainly terrestrial bird, although strong, is rarely sustained. Standard with grouse, the Lesser's diet is dependent on season. In fall and winter, it eats acorns, while spring and summer provide it with buds and fruits of sumac (*Rhus*), legumes, and other plants; when available, wheat, sorghum, and other grain are consumed as well as insects—especially beetles and grasshoppers. These prairie chickens return yearly to the same booming grounds—usually a short-grass, or bare, knoll—where they perform their vigorous nuptial strutting. Attempts to transport Lessers from their original territory to more favorable habitat often fail, since transplanted birds tend to find their way back to their home grounds (J. S. Ligon).

Lesser Prairie Chickens utter various clucks, cackles, and low gobbles. The male's booming is comparable to that of the Greater but is neither so resonant nor so loud.

CHANGES: Most of the Lesser Prairie Chicken's decline, in contrast to that of the Greater, has taken place in the twentieth century. According to figures released by the Texas Parks and Wildlife Department and its predecessor, the Texas Game, Fish and Oyster Commission, there were some 2,000,000 Lessers in the state during the years immediately prior to 1900. At that time the habitat was little disturbed because there was virtually no way to irrigate large sections of this dry sandy soil. In north Texas starting in the 1920's, many artificial lakes were created; also powerful steam, gas, and electric well pumps began lowering the water table to irrigate huge acreages of cotton, sorghum, and other crops. Remaining dry rangeland, during the 1930's, began receiving the first of many doses of herbicide. Ranchers, aided by subsidies from the U.S. Soil Conservation Service, poisoned or bulldozed vast stands of woody vegetation—including the Lesser's necessary sand shinnery oak and sand sagebrush—in an effort to grow more grass to support more cattle for more people. Nowadays (1960's into 1970's), summertime motorists in the Panhandle drive for mile after mile through chemically deadened shrubland—a January-in-June landscape. There were about 12,000 Lesser Prairie Chickens in 1937. By 1963 the population had dropped to 3,000 birds (J. L. Sands, 1968, *Audubon Field Notes* 22: 454). By 1967, the population had risen to 10,000 (fide Paul A. Johnsgard); however, farmers still complain that these grouse are eating their wheat. Actually, in the 1970's, the chief gallinaceous grain eaters in Panhandle Texas, as elsewhere, are domestic poultry and imported pheasants.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt and wear from winter plumage. Colors similar to nuptial adult male of the Greater Prairie Chicken, *Tympanuchus cupido*, but dark bars of upper surface, sides, and flanks narrower and mostly triple, with light bar of cinnamon or whitish enclosed by two dark bars; feathers of neck and wings narrower; size decidedly smaller. Bill dark brown; air sacs dull red, at least in breeding season; iris dark brown; feet yellow; claws brownish black. *Adult male, winter:* Acquired by com-



plete postnuptial molt. Similar to nuptial adult male, but more richly colored, upper and lower parts darker and more rufescent. *Adult female, nuptial*: Acquired by partial prenuptial molt and wear from winter. Similar to adult male, but neck-tufts much less developed, often only rudimentary; tail broadly barred with buff or tawny, at least on outer webs of tail feathers, and lower tail-coverts also with similar broad bars throughout. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female but somewhat more richly colored. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, except for outermost two primary coverts and outermost two primaries of each wing retained from juvenal plumage, the latter pointed instead of rounded. *Male, first winter*: Acquired by postjuvenal molt, complete except for retained outermost two primary coverts and outermost two primaries on each wing. Similar to first nuptial male but more richly colored. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female, except for retained outermost two primary coverts and outermost two primaries of each wing, the latter pointed instead of rounded. *Female, first winter*: Acquired by complete postjuvenal molt, except for retention of outermost two primary coverts and outermost two primaries of each wing. Like first nuptial female, except for rather richer coloration. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults but more rufescent; crown between tawny and ochraceous tawny; bars above more irregular and less completely triple; similar to juvenal of *T. cupido* but more rufescent and dark bars on upper surface and flanks more inclined to be triple. *Natal*: Similar to natal of *T. cupido*, but upper parts lighter, brighter, and slightly more yellowish, as well as less heavily spotted with buff; lower parts also paler and brighter. Pileum and hindneck honey yellow, verging toward cinnamon buff, with fairly large black spots medially on both areas; back and wings chamois, washed with sayal brown or cinnamon; rump honey yellow, overlaid with light tawny; upper back with brownish black or olive brown transverse irregular narrow bars; remainder of back mottled or spotted with same color; wings with large transverse spots; lower back and rump spotted with brownish black; sides of head and lower parts deep colonial buff, but slightly darker on jugulum and upper half of sides of head; has small elongated irregular black spot above auriculars.

MEASUREMENTS: *Adult male*: Wing, 207.0–220.0 (average, 212.1) mm.; tail, 87.9–95.0 (93.0); bill (exposed culmen), 16.5–18.0 (17.3); height of bill at base, 9.4–10.9 (10.4); tarsus, 42.9–47.0 (44.2); middle toe without claw, 36.6–39.9 (39.1). *Adult female*: Wing, 195.1–200.9 (198.1); tail, 81.0–87.1 (84.3); bill, 15.0–17.0 (16.0); height of bill, 9.4–10.4 (9.9); tarsus, 41.9–42.9 (42.2); middle toe, 36.6–39.9 (38.4).

TEXAS: *Breeding*: Collected in Wheeler (July 31, 1901; H. C. Oberholser; Aug. 10, 1936, A. O'Neil), Jones (2, ca. Apr. 22, 1854, C. L. Taplin), Andrews (Mar. 17, 1854, Taplin), and Cochran (Sept. 5, 1931, G. E. Maxon) cos. *Winter*: Taken in Gray (Dec. 6, 1916, H. C. James), Wheeler (Feb., 1931, R. L. More), Cooke (Jan. 3, 1878, G. H. Ragsdale), Kerr (Dec. 6, 1885, and Jan. 5, Feb. 2, 1886, H. Lacey), Mitchell (fall, 1891, and late Oct., 1892, collector unknown), and Pecos (ca. Jan., 1904, J. S. Lockwood) cos.

NESTING: *Nest*: On plains or prairies; under bush or in tuft of grass; shallow depression in ground, lined with grass or leaves. *Eggs*: 8–13, usually 10–12; ovate; smooth and rather glossy; buff, ivory yellow, or cream yellow; unspotted or with fine dots of pale brown or olive; average size, 41.7 × 32.0 mm.

[SHARP-TAILED GROUSE, *Pedioecetes phasianellus* (Linnaeus)]

SPECIES ACCOUNT

Resembles the somewhat smaller, plumper Lesser Prairie Chicken, but is paler grayish brown with fine mottlings (not bars) of black and buff; lacks neck-tufts; has white spots on wings; tail short, pointed, and edged laterally with white (not rounded, and not largely blackish). In display, male inflates small purplish (not large reddish) air sacs on sides of neck; reveals bare bright yellow eyebrows. Length, 17 in.; wingspan, 26½; weight, 1¾ lbs.

RANGE: C. Alaska and n. Mackenzie to n. Manitoba, n. Ontario, and e. Quebec, south locally to n. Washington, n. Utah, e. Colorado, extreme n.e. New Mexico, Nebraska, e. South Dakota, Minnesota, Wisconsin, and n. Michigan.

TEXAS: *Hypothetical*: Reputedly common during 19th century in extreme northwestern corner of Panhandle (fide Mrs. R. L. Duke). Last sighting (only specific record available): Dallam Co., Buffalo Springs (1 in July, 1905, Mrs. Duke). Said to have largely disappeared from Texas range in 1906 (fide Mrs. Duke).]

American Quails: Odontophoridae

BOBWHITE, *Colinus virginianus* (Linnaeus)

SPECIES ACCOUNT

Common Bobwhite of some authors. A meadowlark-sized quail with stubby gray tail. Finely black-, gray-, and buff-vermiculated brownish above with short indistinct blackish crest on crown; conspicuous white throat and white stripe over eye (these areas buffy in female); narrowly black-barred buffy below with russet streaks on sides. Length, 9½ in.; wingspan, 14½; weight, 6½ oz.

RANGE: S.e. Wyoming, s. Minnesota, s. Ontario, and s. Maine, south to e. New Mexico, Gulf states, and Florida, thence through e. and c. Mexico to s.e. Nayarit, Oaxaca, and Guatemala; rare and local in Sonora; also Cuba and Isle of Pines. Naturalized as pure races or mixed stock in s. British Columbia, Washington, Oregon, Idaho, Montana, Colorado; also New Zealand, Island of Hawaii (success doubtful), and in West Indies on Andros, New Providence, Eleuthera, Cuba (introductions from Texas and Florida have largely supplanted native race, except on Isle of Pines), Hispaniola, Puerto Rico, and St. Croix.

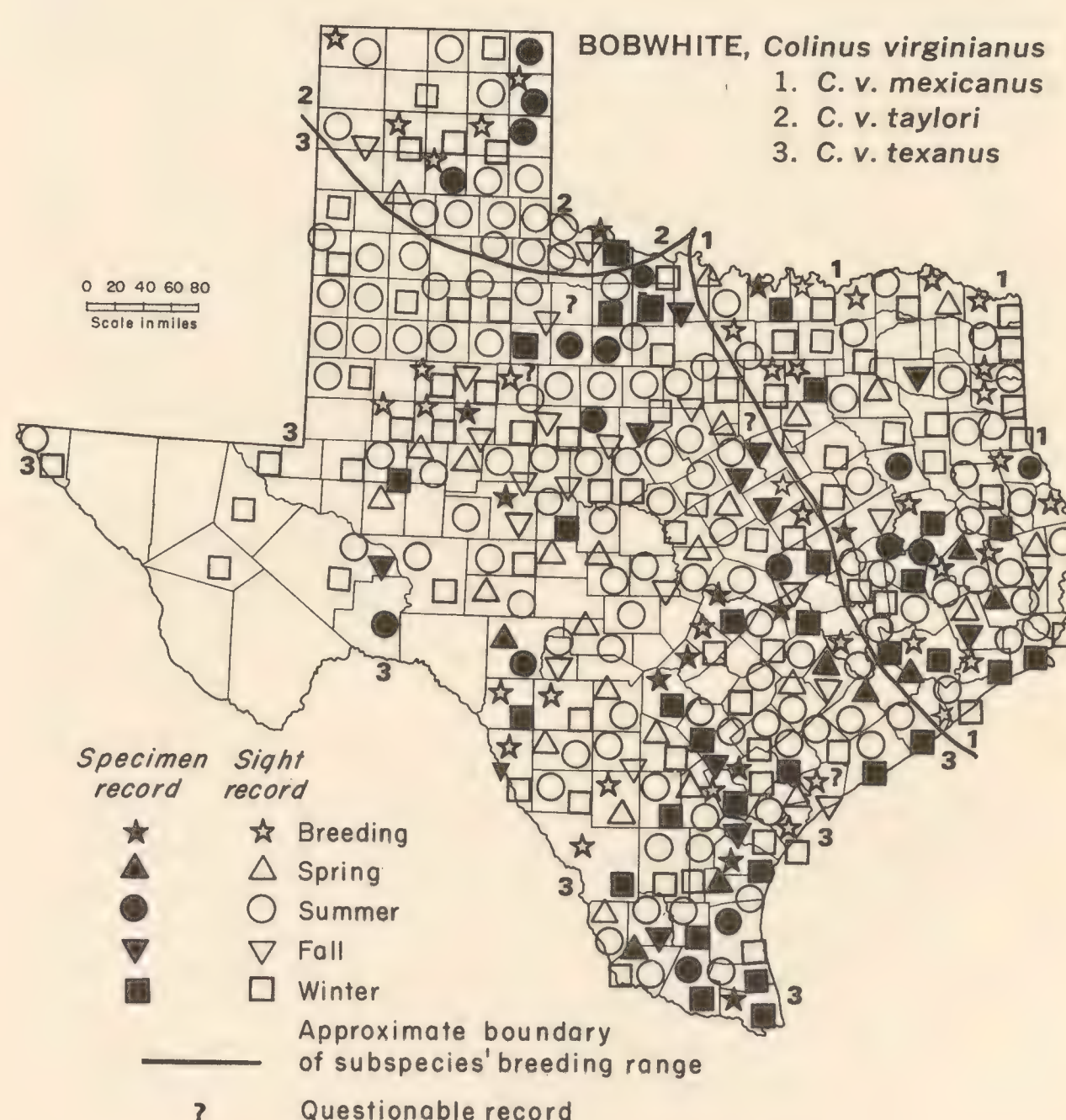
TEXAS: (See map.) *Resident*: Breeds, early Mar. to mid-Oct.—exceptionally to Nov. (eggs, Mar. 15 to Nov. 9; young 4 days old as late as Oct. 8) from near sea level to 4,700 ft. Irregularly very common to fairly common throughout state east of Pecos River valley; uncommon to scarce in most counties bordering Pecos River; rare in Davis Mts. Introduced at El Paso, but current (1972) status uncertain.

HAUNTS AND HABITS: The Bobwhite—usually classified in the cosmopolitan, 165-species Phasianidae—is the most successful of the four native-to-Texas quail. Primarily east of the 102nd meridian, *Colinus virginianus* resides virtually everywhere—from sandy semi-arid mesquite country and open pine-oak woodlands to upland coastal prairie. Chief requisites are some grass and woody and herbaceous cover sufficiently dense to provide concealment, nesting, and food but open enough to allow freedom of movement and visibility; consequently, the Bobwhite avoids habitat extremes—deep forests and barren land. This moderately gregarious bird maintains coveys except during the breeding season.

When flushed, Bobwhites rise with a whirr and fly

away rapidly; soon fatigued, however, they sail again into cover. Apparently, the ordinary limit of endurance on the wing is not much more than a quarter of a mile. Endangered birds initially freeze and rely on protective coloration; less frequently they dart off swiftly and plunge into the first grass clump, thorn bush, or briar patch. At night, members of a flock often roost in a circle with their heads forming the perimeter. This allows for easy escape in times of peril—the whole circle simply explodes like a bomb. A Bobwhite covey maintains a feeding territory and ordinarily does not permit penetrations by other coveys; it also limits its numbers to twenty-five or thirty individuals and invading quail are not accepted unless the group is short its quota.

The Bobwhite's mainstay is various seeds of weeds, grasses, grains, shrubs, and trees; in Texas, doveweed (*Croton*) is the chief wild seed provider, because it is found in practically all of this quail's various habitats. In addition, birds consume leaves of tender plants, such as clover, ragweed, chickweed, dock, others; insects, a primary food for young, are also eaten by adults.



Dispersed covey members communicate with *quoi-hee*'s. In spring, the male's *bobwhite!* or *poor bob-whoit!* stimulates the female's response: *a-loie-a-hee*.

DETAILED ACCOUNT: THREE SUBSPECIES

INTERIOR BOBWHITE, *Colinus virginianus mexicanus* (Linnaeus)

Split from *C. v. virginianus* of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male, nuptial plumage (normal phase):* Acquired by partial prenuptial molt and wear from winter plumage. Outermost two primaries of each wing rounded at tips; top of head black, bordered on each side by broad superciliary stripe of white which passes into cinnamon buff on sides of occiput; central patch on occiput and nape russet, this somewhat streaked or spotted with black and pale buff; lower hindneck and upper back sorghum brown or light walnut brown, edged with hair brown and neutral gray, also more or less barred and vermiculated with dull black or fuscous black; remainder of upper surface mouse gray, washed and spotted with russet, middle of lower back with large spots of black and russet; tail deep neutral gray, middle feathers brownish drab, their shafts dull black as are terminal portions of shafts of upper tail-coverts; wing-quills fuscous, outer webs of primaries hair brown, secondaries mottled and irregularly barred on outer webs with tawny, all secondary wing-coverts tawny, obscurely barred with fuscous on some of inner webs, but primary coverts fuscous or hair brown, unmarked; scapulars and tertials hair brown or neutral gray, but on terminal portion mostly auburn, edged broadly on inner webs with cinnamon buff, mostly with minute vermiculations of all these colors, and marked terminally with large spots or vermiculations of black; broad black stripe on each side of head and of neck below eye, joining across throat to form narrow black collar enclosing white throat; jugulum pecan brown, anteriorly more or less streaked with white; remainder of lower parts white or buffy white, numerous and narrowly barred with black, sides broadly streaked with tawny or russet; crissum mostly tawny or russet with fuscous shaft streaks and white tips of feathers; lining of wing hair brown, mottled with white. Bill black or dark brown with darker tip and paler mandible; iris dark brown; feet smoke gray, broccoli brown, olive brown, olive buff, or bister; claws black. *Adult male, nuptial (reddish phase):* Whole plumage deep reddish brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male but colors deeper and richer. *Adult female, nuptial (normal phase):* Acquired by partial prenuptial molt and wear from winter. Similar to nuptial adult male, but secondary wing-coverts duller, paler, and much more barred with fuscous and russet; superciliary stripe and throat clay color, instead of white; pileum with usually much less black; bars on lower parts usually more brownish; jugulum more rufescent, less pinkish. Iris hazel. *Adult female, nuptial (reddish phase):* Like reddish phase of male. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female but coloration somewhat darker and richer. *Male and female, second winter:* Acquired by complete postnuptial molt. Same as corresponding sex and phase of adults in winter. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but outermost two primaries of each wing pointed instead of rounded; primary coverts as in juvenal; upper surface duller and lighter; under parts more buffy and less heavily barred. *Male, first winter:* Acquired by complete postjuvenile molt, except for primary coverts and outermost two primaries of each wing which are retained from juvenal. Similar to first nuptial male but colors somewhat darker. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult female, but primary coverts as in juvenal; upper surface rather duller and lighter; lower parts somewhat more buffy and less heavily barred; and outermost two primaries of each wing pointed instead of rounded. *Female, first winter:* Acquired by

postjuvenile molt, complete except for primary coverts and outermost two primaries on each wing. Similar to first nuptial female, but plumage rather darker and more blended. *Male, juvenal (normal phase):* Acquired by complete postnatal molt. Outermost two primaries of each wing with pointed tips; top of head dull hair brown, more or less mottled with dull black; remainder of upper parts rufescent brown, variegated with white, buffy white, and dull black; sides of head dull white; throat dull white; jugulum and breast dull grayish brown with dull white streaks; abdomen dull white; primary coverts dark brown with buff shafts and white to light buff tips and edges. *Female, juvenal (normal phase):* Acquired by complete postnatal molt. Similar to juvenal male, normal phase, but coloration rather duller; throat buff. *Juvenal, male and female (reddish phase):* Similar to corresponding sex of reddish phase adult but with some white on chin, throat, and jugulum. *Natal (normal phase):* Upper parts chestnut; head buff, more or less mixed with dull black, crown with patch of chestnut; postocular stripe brownish black; remainder of sides of head ochraceous buff; lower parts pale buff; dull white on throat. Bill, tarsus, and toes light flesh color. *Natal (reddish phase):* Similar to normal phase, but chestnut on both upper and lower parts.

MEASUREMENTS: *Adult male:* Wing, 108.0–116.1 (average, 111.8) mm.; tail, 56.9–64.0 (61.0); bill (exposed culmen), 13.0–14.5 (13.7); height of bill at base, 8.9–10.4 (9.7); tarsus, 30.5–34.0 (32.3); middle toe without claw, 26.9–29.9 (28.2). *Adult female:* Wing, 104.1–112.5 (109.2); tail, 57.9–64.0 (60.2); bill, 12.4–13.7 (13.2); height of bill, 8.9–9.9 (9.1); tarsus, 29.9–33.0 (31.8); middle toe, 26.9–29.4 (28.4).

RANGE: E. South Dakota and s. Ontario to c. New York, south to s.e. Texas and n.w. Florida.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 750 ft. Collected northwest to Cooke, east to Shelby and Jefferson, south to Brazoria cos. Common.

NESTING: *Nest:* In fields, meadows, woodlands, or undergrowth or along fence rows or roads; on ground, in grass, or among bushes, sometimes arched over with covered passage, usually well hidden; composed of dry grass, leaves, weeds, and straw; lined with fine grass, straw, and strips of bark. *Eggs:* 7–42 (large numbers probably laid by more than one bird), usually 10–15; rounded ovate to subpyriform; smooth to slightly glossy; dull white, occasionally buff; unmarked but sometimes nest stained; average size, 29.9 × 23.9 mm.

GREAT PLAINS BOBWHITE, *Colinus virginianus taylori* Lincoln

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. v. mexicanus*, but upper parts paler and somewhat more grayish. Similar to *C. v. texanus* (see below), but more rufescent (less grayish) on upper parts; bars on lower surface narrower.

MEASUREMENTS: *Adult male:* Wing, 109.0–116.6 (average, 111.8) mm.; tail, 56.9–67.1 (60.2); bill (exposed culmen), 13.0–15.0 (13.7); height of bill at base, 8.4–9.4 (8.6); tarsus, 31.5–34.0 (32.8); middle toe without claw, 26.9–31.5 (29.2). *Adult female:* Wing, 106.9–116.6 (111.3); tail, 55.1–64.0 (60.7); bill, 13.0–14.5 (13.7); height of bill, 8.1–9.4 (8.6); tarsus, 29.9–33.0 (31.2); middle toe, 25.9–29.9 (28.2).

RANGE: S.e. Wyoming and s.w. Nebraska, south to e. New Mexico, n. Texas, and c. Oklahoma.

TEXAS: *Resident:* Altitudinal breeding range, 900 to 4,700 ft. Collected north to Lipscomb and Armstrong, southeast to Wilbarger and Clay cos. Pair of adults with about 20 young, assumed to be of this race, observed in Dallam Co., Texline (July 31, 1903, A. H. Howell). Common. Two specimens outside regular breeding range: Dallas Co., 12 mi. north of Dallas (Dec. 6, 1939, W. A. Mayer).

NESTING: Similar to that of *C. v. mexicanus*.

TEXAS BOBWHITE, *Colinus virginianus texanus* (Lawrence)

DESCRIPTION: *Adult male and female, nuptial plumage:* Simi-

lar to *C. v. taylori* but smaller; lighter and more grayish above, with less black; barring of lower parts broader. Bill black; iris dark brown; legs and feet olive gray; claws black.

MEASUREMENTS: *Adult male*: Wing, 104.1–109.0 (average, 106.1) mm.; tail, 55.9–62.0 (59.2); bill (exposed culmen), 11.4–12.7 (11.9); height of bill at base, 8.6–9.4 (8.9); tarsus, 29.4–32.0 (30.7); middle toe without claw, 25.4–27.9 (26.7). *Adult female*: Wing, 101.1–109.0 (105.9); tail, 55.1–62.0 (58.7); bill, 11.4–12.4 (11.9); height of bill, 8.1–8.9 (8.6); tarsus, 28.9–31.0 (29.9); middle toe, 24.9–27.4 (26.7).

RANGE: S.e. New Mexico and n. central Texas, south to c. Nuevo León and c. Tamaulipas.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 3,300 ft. Collected north to Haskell, east to McLennan and Matagorda, south to Cameron, west to Maverick and Pecos cos. Common. No specimen from introduced birds in El Paso Co.

NESTING: *Nest*: Similar to that of *C. v. mexicanus*. *Eggs*: 9–33, usually 10–15; average size, 29.9 × 23.9 mm.

SCALED QUAIL, *Callipepla squamata* (Vigors)

SPECIES ACCOUNT

Also known as Blue Quail. A pale quail with short white-tipped crest on crown ("cotton top"). Largely bluish gray-brown with blackish scaling on neck, back, and under parts; whitish streaks on gray sides. Length, 10½ in.; wingspan, 14½; weight, 7¼ oz.

RANGE: S. Arizona, n. New Mexico, s.e. Colorado, and s.w. Kansas, south to Jalisco, Guanajuato, and State of México. Naturalized in Washington.

TEXAS: (See map.) *Resident*: Breeds, early Mar. to mid-Oct. (eggs; Mar. 11 to Sept. 9; young two-thirds grown as late as Oct. 11) from about 100 (formerly near sea level) to 5,500 ft.—rarely to 7,800 ft. Irregularly very common to fairly common in most of western third; rare and declining—formerly fairly common—

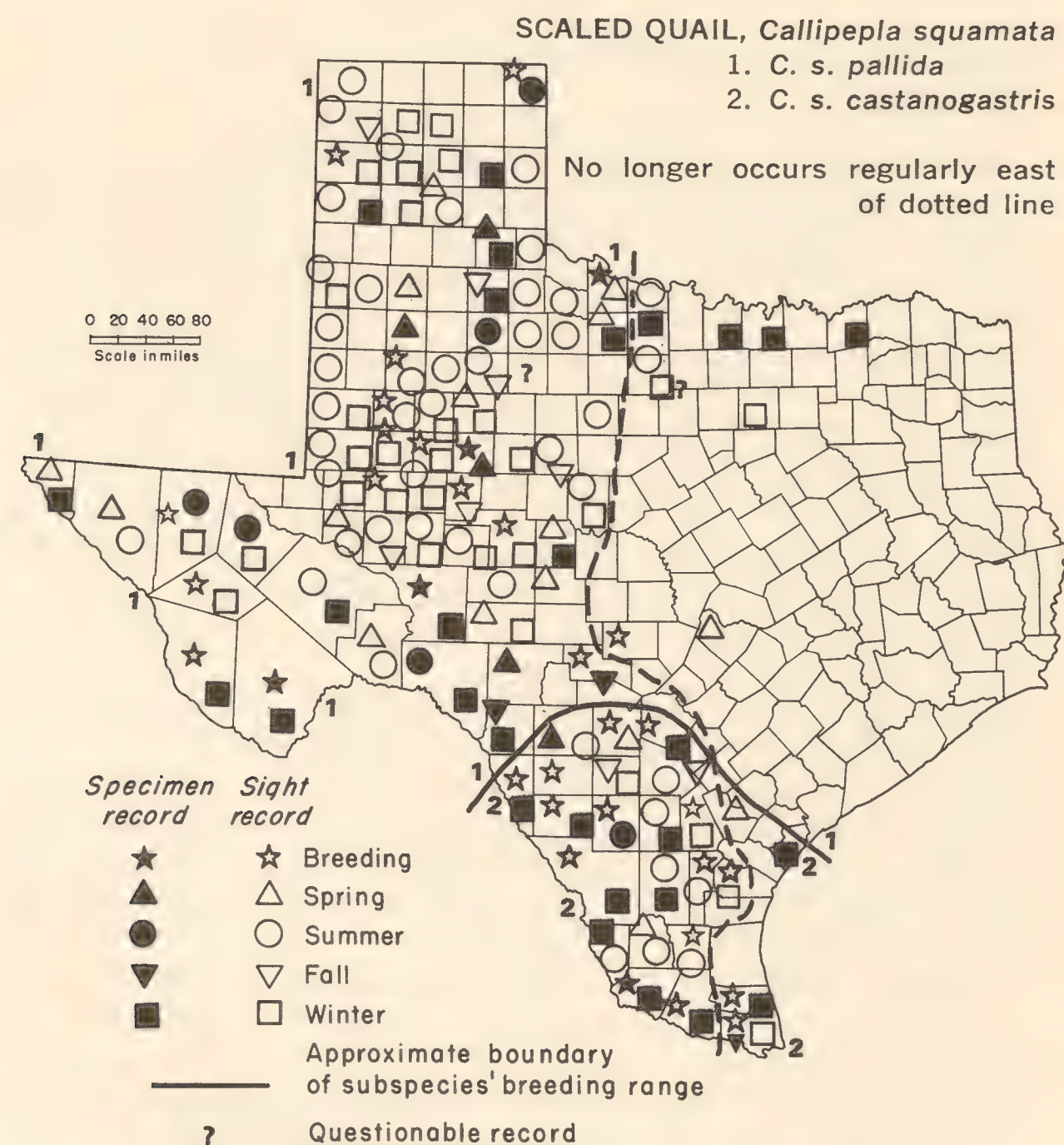
east to Wichita, Young, Coleman, and Gillespie cos., southward to towns of San Antonio, Beeville (nesting unconfirmed), Alice, Falfurrias, and Mission; formerly to central and lower coast. *Vagrant*: Nonbreeders have straggled east (chiefly in winter) to Fannin, Tarrant, and Travis cos.

HAUNTS AND HABITS: In Arizona and New Mexico, and in many books, the quail of the desert is the Gambel's Quail, but in Texas it is the Scaled Quail which predominates in the land of little rain. *Callipepla squamata* flourishes both in the ocotillo-cholla-grassland desert of the Trans-Pecos and in the thickety prickly-pear-mesquite brush country of south Texas. The Scaled is much less tied to the vicinity of water than is the Gambel's Quail, and coveys range miles out into the dry terrain. Apparently water is more a luxury than a necessity to *Callipepla*; individuals can live for extended periods on the fluid from insect bodies. Except during the breeding season, the Scaled moves in flocks, often of considerable size.

Powerful and swift afoot, this bird is mainly terrestrial. Instead of flying over obstacles, the Blue Quail tries to walk around or under them. Quail trappers take advantage of this trait as they slowly walk flocks into the wings of funnel traps. Fortunately the incentive for this illegal practice is not great, as most Texans much prefer to eat the flesh of high-flying Mourning Doves. If suddenly surprised at close range, the Scaled Quail flushes but drops almost immediately and starts to run. Necks upstretched and white crests perked, members of a frightened flock scatter in all directions or scurry off Indian file; these blue-gray birds quickly fade from sight in desert haze or amid the gray-stemmed bushes of a dense thicket. Although more insectivorous than other U.S. quails, the Scaled feeds primarily on wild seeds and fruits—a few include those of elbowbushes (*Forestiera*), catclaws (*Acacia*), pricklypear and cholla cacti (*Opuntia*), and mesquites (*Prosopis*). About ranch houses, individuals sometimes eat grain with chickens and take shelter in nearby woodpiles. During midday, birds often rest in trees but apparently at night prefer to stay on the ground.

Vocalizations of the Scaled Quail include a low nasal whistled *pe-cos* and a loud barking *kuck-yur*. Border Mexicans translate this quail's most frequent call as *tostón* (tos-TONE), which name they apply to the species.

CHANGES: The Scaled Quail has shown considerable shrinkage on the eastern margin of its Texas range. As of 1900, the species flourished in the western half of the state. Between 1940 and 1970, the area of healthy density more nearly approximated the western third—but there were still occasional occurrence records in most of the largely abandoned eastern margin; apparently this area, during primitive flourishing, received numerous surplus individuals from the species' metropolis. As a general rule, which is applicable all the way from extreme northern to extreme southern Texas, the species no longer permanently occupies regions with



average annual rainfall of more than 27 inches. Thus, Bee County with its 29.61 inches is currently too wet, but McMullen County, a few miles west in the same latitude, with its 26.58 inches is still (1972) a good place for Blue Quail. Clearing of the bird's pricklypear cactus and mesquite habitat has been roughly equal in the two counties. Counties with annual averages above 30 inches have not supported *Callipepla* populations within historic times. Since 1940, additional range loss has been slight, but excessive brush clearing has thinned the species locally.

DETAILED ACCOUNT: TWO SUBSPECIES

ARIZONA SCALED QUAIL, *Callipepla squamata pallida* Brewster

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt from winter plumage. Male has slightly larger, bluer head and yellowish cream tint on throat (grayish in female). Crown, nape, and sides of head brownish light neutral gray; short, rather stiff crest of buffy brown, tipped with dull white or buffy white; hindneck light neutral gray to neutral gray, feathers with well-defined squamate tips of fuscous or dull black; back and rump hair brown; upper tail-coverts brownish neutral gray; tail neutral gray, edges of feathers somewhat brownish; wing-quills between drab and hair brown; remainder of exposed surface of wing buffy drab; tertials edged broadly on inner webs with white or buffy white; chin and upper throat cream or dull grayish; jugulum and upper breast light neutral gray, feathers with clearly defined narrow tips of fuscous or dull black; abdomen and crissum light buff or cream color, barred conspicuously with fuscous or fuscous black, crissum streaked broadly with drab or hair brown; sides mouse gray or brownish neutral gray with broad shaft streaks of white; lining of wing light hair brown or grayish drab, mixed with dull white. Bill black; iris hazel; legs light brown. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults, but colors somewhat darker, particularly light edgings of feathers of upper surface. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but outermost two primaries of each wing pointed instead of rounded. *First winter:* Acquired by postjuvenile molt, complete except for primary coverts and outermost two primaries of each wing. Similar to nuptial adults, but outermost two primaries of each wing pointed instead of rounded; coloration rather lighter. *Juvenal:* Acquired by complete postnatal molt. Pileum grayish buffy brown with short crest of vinaceous buff or wood brown; remainder of upper parts brownish gray, feathers of mantle with shaft streaks which broaden at tips of feathers, mantle also much mottled, barred, or spotted with sepia, fuscous black, and tawny; tail dark grayish drab, more or less mottled with dull white or buffy white; lower parts grayish white or buffy white (abdomen most buffy) and, except for chin and upper throat, barred with hair brown, also breast and jugulum more or less conspicuously spotted with dull white, many feathers also with white shaft streaks. *Natal:* Top and sides of head cinnamon buff or pinkish buff, center of crown and of hindneck broadly chestnut, bordered on each side with stripes of black and buffy white; small crest dull gray; spot on auriculars dark chestnut; remainder of upper surface mixed with russet and pale buff; throat and chin buffy white; remainder of lower surface light grayish buff.

MEASUREMENTS: *Adult male:* Wing, 116.1–120.9 (average, 118.6) mm.; tail, 80.0–89.9 (83.8); bill (exposed culmen), 13.5–15.0 (14.0); height of bill at base, 8.9–10.2 (9.4); tarsus, 31.0–35.1 (33.0); middle toe without claw, 26.9–27.9 (27.4). *Adult female:* Wing, 113.0–119.1 (116.3); tail, 75.9–86.1 (81.0); bill, 12.4–14.0 (13.5); height of bill, 8.1–9.7 (8.6); tarsus, 30.5–34.0 (32.3); middle toe, 25.9–27.9 (26.9).

RANGE: S.e. Colorado and s.w. Kansas, south to s. Arizona,

extreme n. Sonora, w. Texas, and n.w. Coahuila. Naturalized in Washington.

TEXAS: *Resident:* Altitudinal breeding range, 550 to 5,500 ft.—rarely to 7,800 ft. Collected north to Deaf Smith and Lipscomb, east to Archer and Kerr, south to Kinney, west to Brewster and El Paso cos. Common. *Vagrant:* Four specimens: Montague Co. (Dec. 4, 1951, T. A. Lesperance); Cooke Co., Gainesville (Feb. 26, 1886, G. H. Ragsdale); Fannin Co., Bonham (2 in Dec., 1885, H. F. Peters).

NESTING: *Nest:* On plains, dry mesas, or tablelands, sometimes far from water; depression in ground, often sheltered by yucca or other bush; composed of a few grasses and leaves; lined with same materials. *Eggs:* 8–16, usually 11–12; ovate or short ovate to subpyriform; white, buffy white, or cream color; irregularly marked with round dots of light brown, reddish brown, vinaceous buff, and fawn color; average size, 32.3 × 25.1 mm.

CHESTNUT-BELLIED SCALED QUAIL, *Callipepla squamata castanogastris* Brewster

DESCRIPTION: *Adults, nuptial plumage:* Similar to *C. s. pallida* but darker; posterior lower parts more buffy; abdomen with more or less well defined patch of chestnut.

MEASUREMENTS: *Adult male:* Wing, 109.0–117.6 (average, 115.3) mm.; tail, 77.0–86.1 (82.0); bill (exposed culmen), 13.0–15.0 (14.0); height of bill at base, 8.6–9.9 (9.1); tarsus, 31.0–34.5 (32.8); middle toe without claw, 24.9–28.4 (26.2). *Adult female:* Wing, 109.5–117.6 (113.8); tail, 75.4–83.6 (79.7); bill, 13.0–14.5 (13.7); height of bill, 8.1–8.9 (8.6); tarsus, 27.9–33.0 (31.0); middle toe, 23.9–26.9 (25.1).

RANGE: S. Texas, south to n.e. Coahuila, n. Nuevo León, and Tamaulipas.

TEXAS: *Resident:* Altitudinal breeding range, about 100 (formerly near sea level) to 1,000 ft. Collected northwest to Maverick, southeast to Duval and Hidalgo cos.; rarely north to Edwards and Bexar; formerly east to Aransas, south to Cameron cos. Common.

NESTING: *Nest:* In brush, often in lowlands along rivers; on ground or in hole in sand or gravel; slightly lined with dry grass and leaves. *Eggs:* 8–23, usually about 15; ovate to subpyriform; white to buff with minute dots of reddish brown; average size, 31.0 × 23.9 mm.

GAMBEL'S QUAIL, *Lophortyx gambelii* Gambel

SPECIES ACCOUNT

Desert Quail of some authors. Only quail in Texas with an erect black topknot plume. *Male:* largely grayish above; cinnamon crown; black forehead and throat outlined in white; gray breast; buffy belly with large black patch medially; broadly white-streaked chestnut sides. *Female:* coloration paler; lacks black forehead, throat, and belly-patch. Length, 11 in.; wingspan, 14¾; weight, 6 oz.

RANGE: S. Nevada to w. Colorado, south to n.e. Baja California, c. Sonora, n.w. Chihuahua, and Trans-Pecos Texas.

TEXAS: (See map.) *Resident:* Breeds, May to Aug. (eggs on July 5; small young, June 25 to early Aug.) from 2,000 to 4,500 ft. Locally very common to fairly common along Rio Grande from El Paso Co. south to upper Big Bend in Presidio Co. (downriver to Redford), rarely to Big Bend Nat. Park (nesting unconfirmed) and Terrell Co. (nesting doubtful); scarce and local in occurrence (nesting unconfirmed) away



Gambel's Quail, *Lophortyx gambelii*

from river valley east to Van Horn, rarely to Limpia Creek (Jeff Davis Co.) and Alpine.

HAUNTS AND HABITS: The Gambel's Quail, chiefly riparian in Texas, ranges only short distances into nearby desert scrub. Prime haunts are willow-, hackberry-, mesquite-, and tamarisk-lined watercourses flowing in valleys between desert mountains, as well as the cultivated fields and irrigation ditches often found in these areas. The classic Texas Gambel's Quail colony is near the Rio Grande at El Paso's boy scout camp; here Mary Belle Keefer has shown these birds to visitors from all over the nation. Birds scatter from their water sources usually in spring and summer of wet years when succulent plants of hills, canyons, and dry washes can be relied on for both food and drink. Nesting, in fact, depends on the springtime greening of vegetation, which in the desert does not occur without rain; consequently in very dry years *Lophortyx gambelii* does not breed at all. Pairs disperse to raise their broods, but the species is very gregarious at other seasons.

Although swift and strong on the wing, the Gambel's flies reluctantly. Escape in times of danger is ordinarily on foot to the nearest dense thorny thicket, rocky creek bed, or inaccessible canyon; rarely does it crouch and freeze as do the Bobwhite and Harlequin Quail. Birds feed and drink usually in the cool of early morning and toward night and rest during midday heat. A foraging flock usually posts a sentinel. Food includes leaves, buds, and shoots of various plants; corn, wheat, and oat grains; also seeds of saltbush (*Atriplex*), chickweed (*Cerastium*), burclover (*Medicago hispida*), alfalfa (*M. sativa*), others; and a variety of wild fruits; to a lesser degree, ants, beetles, grasshoppers, and other insects. The Gambel's perches easily and is said to roost at night in trees and shrubs.

The assembly call of the Gambel's Quail is a hoarse *cu-cut* or *chi-kar-ke-ker*; another is *qua-el qua-el*. The male's nuptial vocalization has been described as a penetrating *kee-err* (emphasis on the first syllable) or as a fretful-sounding *yuk-kwair-go* (accent on middle note).

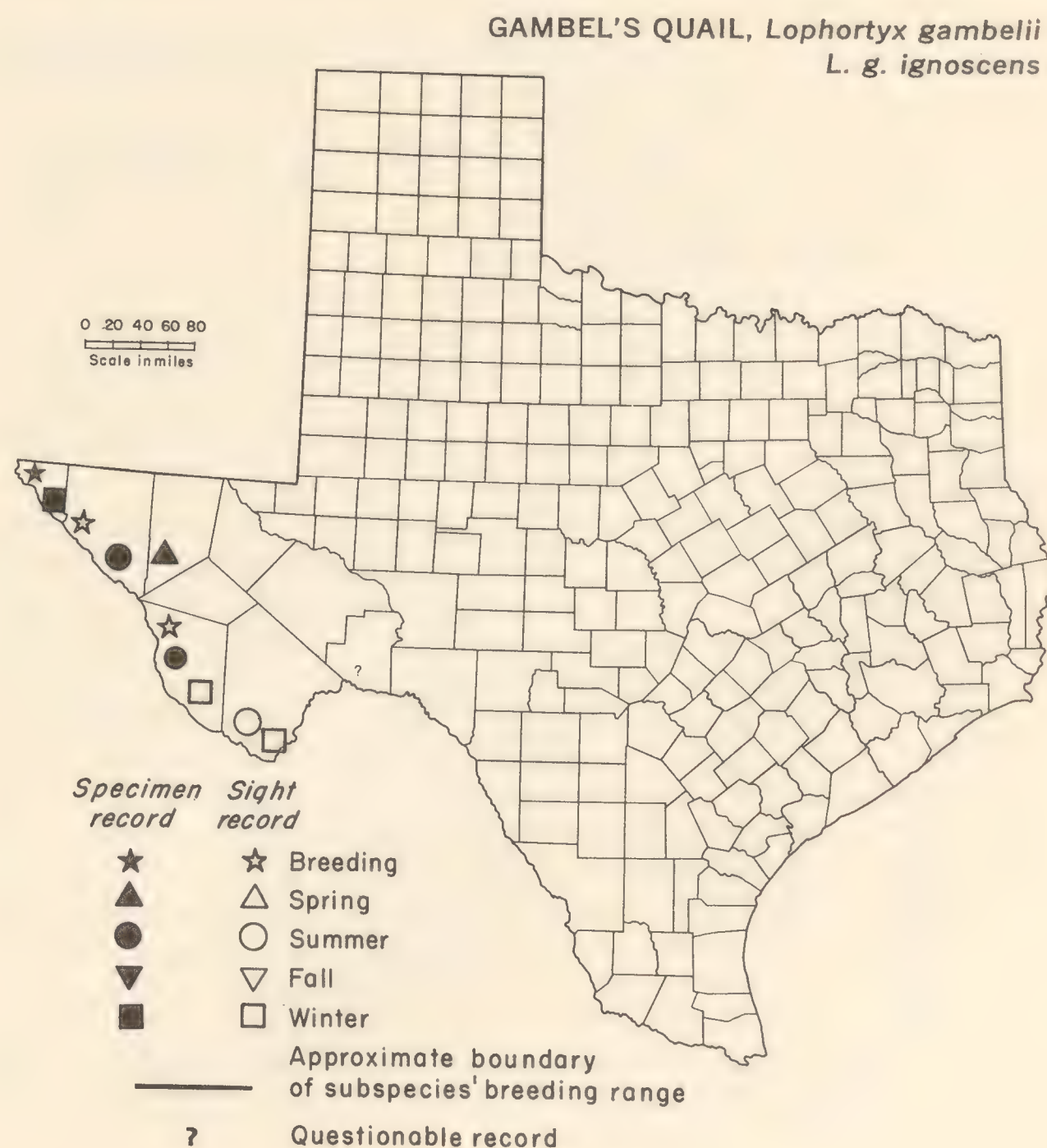
CHANGES: In Big Bend National Park at the extreme eastern edge of the species' range, the Gambel's Quail has been increasingly rare since 1950. Doubtless, some range loss is proceeding here, but so far it is mild indeed compared to the dramatic range shrinkage of the Harlequin Quail.

DETAILED ACCOUNT: ONE SUBSPECIES

TEXAS GAMBEL'S QUAIL, *Lophortyx gambelii ignoscens* Friedmann

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead and sides of crown black, portion next to bill more or less grayish, broad white stripe extending across back part of crown and on each side through the black to nape; center of crown and occiput tawny and cinnamon rufous, with a few-feathered short black crest; nape neutral gray to light neutral gray with shaft lines and narrow tips of fuscous; mantle neutral gray, washed with grayish brown or light grayish olive; rump and upper tail-coverts neu-

tral gray, washed with grayish olive or light grayish olive, these parts fading in summer to mouse gray; primaries between hair brown and drab; secondaries and tertials mouse gray to neutral gray, tertials broadly edged on terminal portions of inner webs with buffy white or very pale buff; tail brownish neutral gray; sides of head, chin, and middle of throat black, bordered on each side by white stripe; jugulum and sides of breast neutral gray to brownish light neutral gray; middle of breast cream buff or warm buff; middle of abdomen fuscous black or black, on each side dull white or buffy white, white more or less barred or streaked with dull black or bay; sides of body between sanford brown and chestnut, broadly streaked with white; crissum and lower abdomen light buff, the former broadly streaked with chaetura drab or fuscous; lining of wing between mouse gray and light drab, coverts edged with dull white and pale buff. Bill black; iris dark brown; legs and feet greenish gray; claws black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but colors rather deeper, particularly areas on upper surface. *Adult female, nuptial:* Acquired by partial prenuptial molt. Pileum russet or prout brown, with a few feathers forming short fuscous crest; remainder of upper surface hair brown, somewhat more ochraceous or rufescent on back; feathers of hindneck with narrow shaft streaks and squamate edgings of fuscous or clove brown; tail rather dark neutral gray, middle feathers mouse gray; primaries principally dark drab, secondaries hair brown, tertials with slight olivaceous tinge, and rather broadly margined on terminal portion of inner webs with buffy white; upper wing-coverts like back; throat light dull pinkish buff, obscurely and narrowly streaked with darker; breast light hair brown, lower part of breast cream buff or cartridge buff with narrow streaks and sometimes obscure bars; abdomen same but duller; sides of body chestnut, broadly streaked with white, crissum broadly streaked with hair brown and somewhat tinged with tawny. Bill reddish above, nearly white below; feet dull flesh color. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female but rather more deeply colored. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but with outermost two primaries of each wing pointed instead of rounded. *Male, first winter:* Acquired by postjuvenile molt, complete with exception of primary coverts and outermost two primaries of each wing retained from juvenile. Similar to adult male in winter



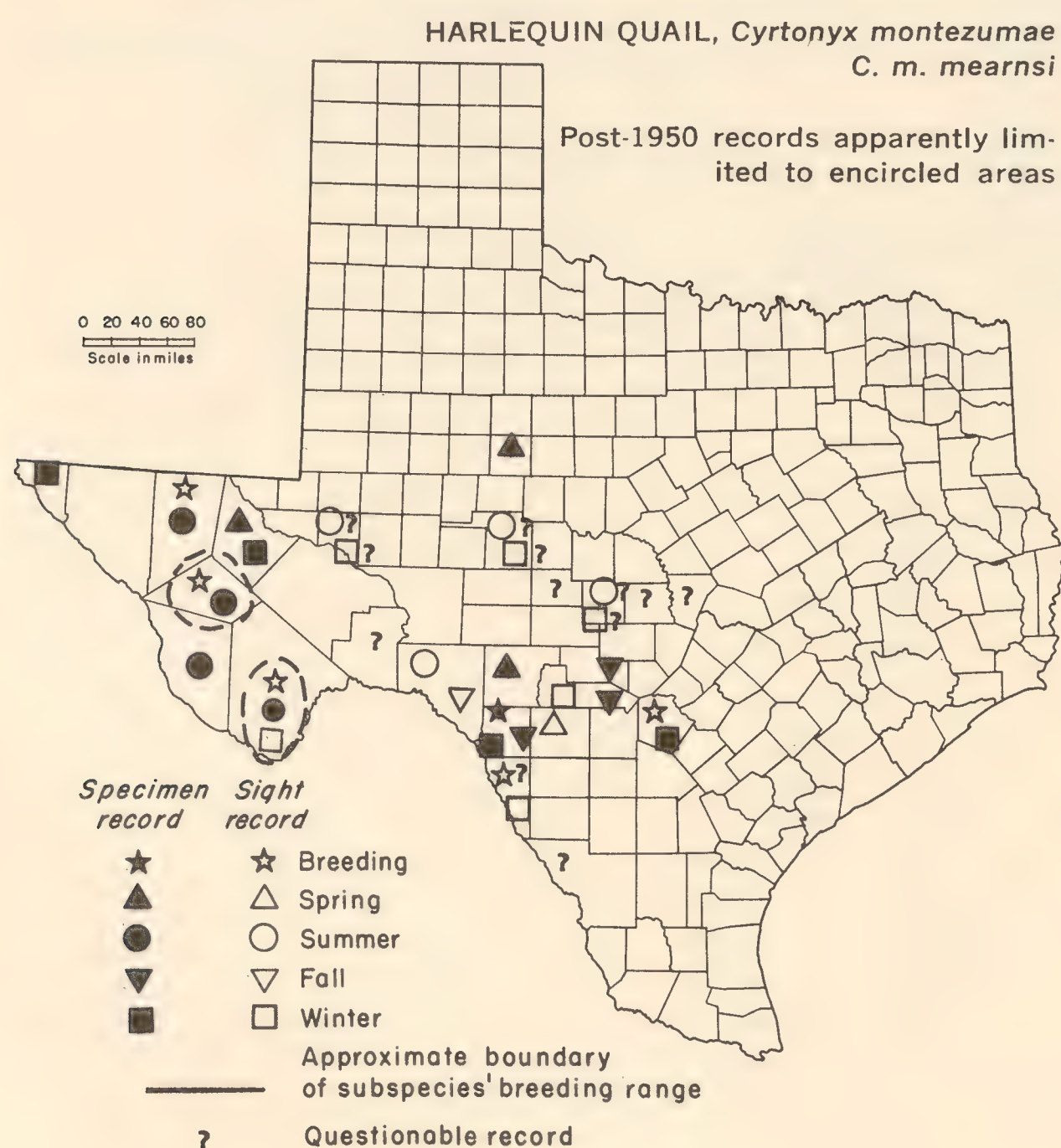
but differs in pointed, instead of rounded, outermost two primaries of each wing. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female except for pointed, instead of rounded, outermost two primaries of each wing. *Female, first winter*: Acquired by postjuvenile molt, complete except for primary coverts and outermost two primaries of each wing. Similar to adult female in winter except for pointed, instead of rounded, outermost two primaries of each wing. *Juvenal*: Acquired by complete postnatal molt. Similar to adult female but without crest; colors duller, upper parts much tinged with tawny, cinnamon, and buff and vermiculated, particularly on wings, with these colors, tertials streaked or spotted on inner webs terminally with fuscous black, and most feathers of upper surface with narrow obscure whitish or dull buff narrow terminal margins; gray of jugulum somewhat mixed with buff; middle of breast and abdomen deeper buff; chestnut of sides darker and much mixed with buff or cinnamon. *Natal*: Top and sides of head clay color to pinkish buff, occiput with broad median area russet with buffy stripe on each side; small spot on auriculars clove brown; remainder of upper surface light pinkish buff, streaked with warm sepia or clove brown; lower parts light grayish buff, somewhat mottled on sides of breast and sides of body with dull light hair brown or drab.

MEASUREMENTS: *Adult male*: Wing, 111.0–116.1 (average, 113.5) mm.; tail, 93.0–101.1 (97.1); bill (exposed culmen), 11.9–13.2 (12.4); height of bill at base, 7.6–8.6 (8.1); tarsus, 29.9–32.0 (31.0); middle toe without claw, 25.9–27.9 (26.7). *Adult female*: Wing, 104.9–116.1 (111.8); tail, 90.9–97.1 (93.2); bill, 11.9–13.0 (12.4); height of bill, 7.6–8.6 (8.1); tarsus, 27.4–32.0 (30.5); middle toe, 24.9–28.7 (26.7).

RANGE: Locally in extreme s. New Mexico and upper Rio Grande Valley of Trans-Pecos Texas.

TEXAS: *Resident*: Collected in El Paso, Hudspeth, Culberson, and Presidio cos.

NESTING: *Nest*: In brush or scattered timber, in mountains, valleys, and on mesas; on ground, or in Roadrunner or thrasher nest a few feet above the ground; usually in hole in sand, sometimes in wood rat den; without lining or lined with leaves and dry grass. *Eggs*: 8–20, usually 10–12; short ovate; smooth and a little glossy; dull white, white, or pale buff; blotched, spotted, and clouded irregularly with dark brown and ecru drab; all these markings suffused with pinkish or purplish bloom; average size, 31.5 × 23.9 mm.



HARLEQUIN QUAIL, *Cyrtonyx montezumae* (Vigors)

SPECIES ACCOUNT

Montezuma Quail and Massena Partridge of some authors. Also known as Mearns' Quail (U.S. race), and colloquially as "fool quail." A rotund quail with swept-back, helmetlike crest—buffy in male, brownish in female. *Male*: black-, cinnamon-, and buff-variegated mantle; black markings on white face forming distinctive harlequin mask; dark chestnut breast; dark gray sides and flanks, liberally spotted with white; black abdomen, crissum. *Female*: facial pattern obscure; dull brownish above with black and buff streaks; lightly black-flecked pale brown below. Length, 8¾ in.; wingspan, 16½; weight, 6¼ oz.

RANGE: C. Arizona, New Mexico, and w. Texas, south to Oaxaca and Veracruz.

TEXAS: (See map.) *Resident*: Breeds, late May to early July (eggs, June 1 to June 23) from about 400— at least formerly—to nearly 8,000 ft. Formerly fairly common in most of Trans-Pecos, east locally across Edwards Plateau to Nolan, Burnet, and Bexar cos. Since 1950, scarce and local in central Trans-Pecos (Davis, Del Norte, and Glass mts.); rare and exceedingly local on southwestern Edwards Plateau (Edwards Co.). Since early 1940's, only two sightings in Chisos Mts., Big Bend Nat. Park (pair seen, May 19, 1962, Adele Harding; pair seen, May 30, 1962, T. B. Feltner); however, 26 birds released in Big Bend Park, Jan., 1973 (fide R. H. Wauer). Formerly casual at Eagle Pass (bred rarely, 1884, fide W. Negley) and at Laredo where one specimen (preserved?) was taken (date unknown, J. H. Clark).

HAUNTS AND HABITS: Of all American upland game birds, the Harlequin Quail is probably the most intolerant of alteration in its habitat. *Cyrtonyx montezumae* requires open woodlands—chiefly pine-oak or juniper-oak—with ground cover of bunch grass on flats and slopes of semidesert mountains and hills. This quail does not assemble in large flocks but instead travels in pairs or small companies.

The Harlequin flies and runs less than other U.S. quail; instead it relies mostly on its protective color pattern—so much so that sometimes it appears foolishly tame. An endangered bird crouches on the ground and freezes. Only when almost stepped on does it flush and then with such a startling burst that often the intruder is the more frightened of the two. The bird flies briefly, barely above the vegetation, before it drops down and crouches again. When aroused, the Harlequin spreads out its crest laterally so that it looks like a mushroom sliced in half vertically. Usually calm and unhurried, this quail walks slowly and noiselessly about its rough haunts. It has strong legs, feet, and claws for scratching tubers and bulbs from the soil—a foraging habit almost unique among American birds. The Harlequin also eats succulent plants in summer, acorns, pinyon nuts, and weed seeds when available, and weevils, caterpillars, bugs, crickets, grasshoppers, and other insects.

The quavering call of *Cyrtonyx montezumae* is a soft ventriloquial whinny which is suggestive of an eastern Screech Owl's tremolos. If this quail flushes, its wings sound a *f-r-r-r-r-r-r-r*, according to the expert ear of L. A. Fuertes.

CHANGES: In Texas, the Harlequin Quail has almost reached that great destination of all earthly life: extinction. It disappeared early around El Paso (apparently last taken in January, 1883), but as late as 1901, when L. A. Fuertes painted his classic Mearns' Quail portrait in the Chisos Mountains, the species still occurred in all Trans-Pecos counties. By the same year, it had begun to fade in the Edwards Plateau portion of its range but probably still had a toehold in all its original plateau counties: Nolan, Tom Green, Concho, Crockett, Schleicher, Menard, Mason, Llano, Burnet, Val Verde, Sutton, Kimble, Edwards, Real, Kerr, Bander, Kinney, Uvalde, and Bexar. By 1940, the Harlequin had lost all its Edwards Plateau distribution except for two small pockets—one in the area where Val Verde, Edwards, and Kinney counties join; the other in the vicinity of Con Can in extreme northern Uvalde County near the Real County line (a healthy pair was viewed here by the senior editor on April 12, 1938). In the Trans-Pecos, the species still appeared viable locally; fairly good numbers persisted in the highest, most secluded parts of Hudspeth, Culberson, Jeff Davis, Brewster, and Presidio counties.

The year 1960 dawned on a grim situation: No colonies of native Harlequins were left in the state outside of the Davis Mountains of Jeff Davis County and the Del Norte and Glass mountains in Brewster County, plus a minute band on a very private ranch in western Edwards County. By 1970, the Davis range apparently was the sole remaining Texas locality where *Cyrtonyx montezumae* could still be seen by nontrespassing bird watchers. In that year, there were very roughly 300 birds in the Davis Mountains, between 30 and 35 in the Del Nortes, and "some" in the Glass Mountains (R. H. Wauer). There is no recent firm information on the Edwards County population.

Throughout the 1960's there were frequent sightings of the noted Davis Mountain Harlequins, usually in the state park, at Bloy's Camp Meeting Ground, on the McIvor Ranch, or along the Mount Locke road to McDonald Astronomical Observatory. Why was the Harlequin Quail able to survive longer in the Davis Mountains than elsewhere? The answer is not readily apparent. Factors—overgrazing, drought, extremely cold winters—operate here as in other areas. However, the Davis range is less steep and contains more extensive grassy flats and slopes than do other Trans-Pecos mountains. Mearns' Harlequin Quail is a very mysterious bird. Who knows exactly what ails it?

DETAILED ACCOUNT: ONE SUBSPECIES

MEARNS' HARLEQUIN QUAIL, *Cyrtonyx montezumae mearnsi* Nelson

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by

partial prenuptial molt and wear from winter plumage. Top of head and short, broad, bushy crest orange cinnamon, cinnamon, or grayish cinnamon buff; forehead white with three broad stripes of black, one of these passing backward above superciliary stripe and down side of neck and meeting stripe on other side across throat, thus forming a narrow collar; feathers of center of crown more or less spotted and streaked with black; broad white superciliary stripe which passes down side of neck in front of black collar and forms broad white collar; a broad malar stripe of white joins this white collar posteriorly; joining the white superciliary stripe in front of eye is another white stripe that passes under eye to auriculars; chin and center of throat black, these both surrounded by white except anteriorly; nape drab or light drab, much spotted with buffy white or dull buff; remainder of upper parts either dull black numerous barred with cinnamon drab, fawn color, or russet, or with the ground of these colors and similarly barred with black—in either case, broadly and pointedly streaked with buffy white or pale buff passing posteriorly into cinnamon buff; tail drab gray, barred or spotted with black and with shaft streaks of cinnamon buff or pale buff; wing-quills dark hair brown, barred, mostly on outer webs, with buffy white or pale buff; wings and upper tail-coverts drab gray, boldly spotted or imperfectly barred with black; middle of jugulum below black collar and middle of breast chestnut; sides of breast and of body, also flanks, slate color with large roundish spots of white; abdomen and crissum black; lining of wing hair brown or light hair brown, speckled with dull white. Bill black, but base russian blue, and tip of mandible puritan gray; iris olive brown; legs and feet mineral gray; claws drab gray. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but coloration somewhat darker. *Adult female, nuptial:* Acquired by partial prenuptial molt and wear from winter. Crown and occiput wood brown or dull clay color, center of crown barred or spotted with black; narrow superciliary stripe of buffy white; nape dull avellaneous, spotted and obscurely streaked with dark brown or dull black; upper parts dull ochraceous tawny or dull cinnamon, much barred with dull black, these bars broadest on nape, with broad pointed shaft streaks of cream buff or cartridge buff; tail dark hair brown and cinnamon, broadly barred or spotted with dull black; wing-quills dark hair brown, barred or spotted on outer webs with buffy white or dull cinnamon; upper wing-coverts dull light cinnamon drab, anteriorly somewhat varied with dull black, and with a few shaft streaks or spots of buffy white or pale buff; chin white; throat avellaneous or pinkish cinnamon, with some narrow dull black bars which form irregular collar connecting with series of such narrow bars on side of neck, and extending up to auricular region where it ends in dull black spot; above this is a postocular streak of dull white; remainder of sides of head avellaneous, more or less spotted with white; jugulum cinnamon drab or fawn color; sides of jugulum with dull white or buffy shaft streaks or spots; middle of jugulum with a few blackish spots or streaks; middle of breast and abdomen wood brown to dull cinnamon buff; sides and flanks similar to jugulum, with some shaft streaks and scattered bars of black, and a few shaft markings of white and dull buff. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female, but colors deeper. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but with outermost two primaries of each wing pointed instead of rounded. *Male, first winter:* Acquired by postjuvenile molt, complete except for primary coverts and outermost two primaries of each wing retained from juvenile. Similar to adult male in winter, but with outermost two primaries of each wing pointed instead of rounded. *Female, first nuptial:* Acquired by partial prenuptial molt. Like nuptial adult female, but outermost two primaries of each wing pointed instead of rounded. *Female, first winter:* Acquired by postjuvenile molt, complete except for primary coverts and outermost two primaries of each wing which are retained from juvenile. Similar to adult female in winter, but outermost two primaries on each wing pointed instead of rounded. *Male, juvenile:* Acquired by complete postnatal molt.

Similar to adult female, but sides and top of head more grayish; lower parts dull gray mixed and barred with dull black, tawny, and cinnamon, particularly on breast and crissum. Bill reddish above, whitish below; feet dull brown. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male, but flanks, abdomen, and crissum grayish white like remainder of under surface. *Natal*: Pileum dull cinnamon buff, centrally dull chestnut; remainder of upper surface dull chestnut, with broad buffy white stripe on each side of back and rump, and somewhat varied with dull black; sides of head dull buffy white or dull cinnamon buff; narrow auricular stripe dull black or fuscous black; lower parts dull buffy grayish white, palest on chin; lower abdomen, flanks, and crissum a little varied with black.

MEASUREMENTS: *Adult male*: Wing, 119.6–129.0 (average, 123.2) mm.; tail, 53.1–61.0 (56.6); bill (exposed culmen), 13.2–15.0 (14.0); height of bill at base, 9.4–10.9 (10.2); tarsus, 27.9–31.0 (29.7); middle toe without claw, 23.6–24.9

(24.1). *Adult female*: Wing, 117.1–126.0 (120.9); tail, 43.9–57.9 (52.3); bill, 13.0–14.5 (13.7); height of bill, 8.9–10.4 (9.7); tarsus, 27.4–29.9 (29.2); middle toe, 22.1–24.4 (23.4).

RANGE: In foothills and mountains from c. Arizona to Trans-Pecos and Edwards Plateau (at least formerly) of Texas, south locally to Jalisco, Durango, and n. Coahuila.

TEXAS: *Resident*: Collected (mostly prior to 1910) north to Nolan, east to Llano (ca. 1858), south to Bexar, west to Kinney, Edwards, Brewster, Presidio, Jeff Davis, Culberson, and El Paso cos.

NESTING: *Nest*: In low woods or brushy, rocky slopes; in hollow on the ground, usually concealed by tuft of grass or bush; composed of grass and weed stems; lined with grass. *Eggs*: 8–14, usually about 10; short ovate or ovate to ovate pyriform; rather glossy; white, without markings; average size, 31.8 × 24.6 mm.

Pheasants: Phasianidae

RING-NECKED PHEASANT, *Phasianus colchicus* Linnaeus

SPECIES ACCOUNT

A rather large Asian game bird with a very long, pointed tail. *Cock*: blackish-mottled iridescent bronzy above and below; glossy dark green head with ear-tufts; red skin-patch on cheeks and about eyes; white neck-ring (sometimes indistinct or absent); black-spotted golden sides. *Hen*: smaller with shorter tail; blackish-mottled brown above; largely buffy below. Length, 33¼ in. (male), 21½ (female); wingspan, 30½ (male); weight, 3½ lbs. (male), 2¼ (female).

RANGE: Native locally in Asia, from s. Russia, Manchuria, and Japan, south to n. Iran, n. Afghanistan, s. China, and Formosa. More or less established in Europe, New Zealand, Hawaii, and in North America from s. British Columbia (including Queen Charlotte Islands) to s. Manitoba and Nova Scotia, south to n. Baja California, Panhandle of Texas, s. Illinois, Pennsylvania, and New Jersey.

TEXAS: *Resident*: Released relentlessly in many localities. By 1940, naturalized locally in northern Panhandle, where fairly common but somewhat irregular. As of 1970, liberated birds elsewhere in state have apparently failed to become established—i.e., have not been breeding enthusiastically as wild birds, without further implants, for more than ten consecutive years.

HAUNTS AND HABITS: No true pheasants are native to North America. First successful introduction of the Ring-necked Pheasant in the United States was in Willamette Valley, Oregon, during the early 1880's. As a rule, this exotic game bird is most prolific in the grain belt of the northern Great Plains; local pockets in other areas often require periodic restocking or shortened hunting seasons to maintain their numbers. An extraordinary hardiness of this species in many places often sparks optimism in hunters and game managers, but twenty- or thirty-year periods of health are frequently followed by decline unless birds are strictly attended. Prime habitat includes agricultural disclimaxes—little-tended grain fields, unmowed meadows, weeds in fallow fields, ungrazed woodlots, and abandoned farms—also brushy fence rows, windbreaks, clumps of conifers in otherwise cutover lands, and edges of marshes or bogs.

With a great burst of speed and metallic whirr of wings, the Ringneck flushes almost vertically. Usually it is the cock which flies off in this manner; the drab hen, relying on protective coloration, more often remains hidden in a thicket or briar patch. Soon, the retreating pheasant scales down to land; the long, streaming tail is fully spread and arched down to help break the bird's momentum. Apparently, most sustained flights are less than a mile. In spring, the polygynous cocks, with much fighting among themselves, establish crowing territories. From these plots each male struts and crows to lure a harem of from four to eight females. Hens, in turn, establish and defend nesting subterritories within their mate's territory where each lays, hatches, and raises her brood. As winter approaches, hens and cocks form separate flocks which range to find good cold-weather cover. Ring-necked Pheasants feed chiefly in morning and evening and are inclined to rest during the day. Grains of oats, barley, corn, wheat, rice, and rye are standard food items as well as seeds of many wild plants, such as foxtail, ragweed, burdock, milkweed, Russianthistle, smartweed, sunflower, lupine, clover, alfalfa, and dandelion. Fruits of elder, wild grape, wolfberry, Virginia creeper, nightshade, and raspberry are eaten; also insects and snails when available.

Pheasants are extremely sensitive to loud noises and shock waves and usually respond to disturbances with crowing. In Japan, they are said to give warning of earthquakes; in England during World War I, cocks, able to detect far-distant explosions, would often announce advancing Zeppelin attacks with outbursts of their crowing.

When proclaiming his territory, the male sounds his challenge call, a loud *kok-cack*, which suggests the cry of a young Bantam; this crow precedes a whirring of wings. When flushed, he utters low hoarse croaking notes. The considerably quieter female sometimes utters querulous *queep, queep, queep's* or a whistling shriek when alarmed.

CHANGES: One of the most irrational traits of man is his optimism. It supports the billion dollar gambling industry. In the wildlife field, the biggest gamble is the importation of foreign species. History has shown that in large continental areas, exotic birds mostly either become pests (Starling, House Sparrow) or promptly die out (most imported game birds). In Texas, as else-

where, thousands of dollars have been wasted in attempts to establish foreign game species. As of 1970, only one—the Ring-necked Pheasant—was definitely established in Texas. Since 1940, increasing irrigation, grain farming, and planted shelter belts of trees have allowed some Ringnecks to live in the northern Panhandle, mostly north of Amarillo. South of this city, such as at El Paso, this pheasant has at times existed for a few years but subsequently expired; a current (1972) population at Balmorhea Lake (Reeves Co.) will probably repeat the El Paso experience. According to some game biologists, most of Texas is too hot and dry to allow Ringneck eggs to hatch properly. In an attempt to circumvent this supposed difficulty, *Phasianus colchicus* strains from in and near Iran, Afghanistan (known to hunters as Afghan White-winged Pheasant), Korea, and other more or less warm and arid Texas-like places were released in 1969–70 by the Texas Parks and Wildlife Department. All sincere friends of native Texas birds hope that this naturalization experiment will fail completely.

DETAILED ACCOUNT: COMPOSITE OF SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead metallic antique green; sides of crown broadly pale buff or buffy white, forming conspicuous stripe on each side of head; crown and occiput metallic hellebore green overlaid with isabella color; upper hindneck metallic dark cedar green, often with white collar reaching around side of neck and across upper part of jugulum, though here sometimes more or less interrupted; lower part of hindneck and upper back clay color, ochraceous, buckthorn brown, cream buff, or ochraceous tawny, feathers with irregular broad V-shaped markings of dull black or brownish black, with practically concealed sub-basal area of dull white or buffy white, and terminal broad shaft spot of metallic dusky greenish blue which in most lights appears black; feathers of upper back fuscous, mottled with buff and buffy white, and each with narrow U-shaped mark of black, and edgings of liver brown to chestnut; scapulars fuscous, much mottled with buff and buffy white, this toward ends of feathers becoming mostly immaculate and producing effect of pale buffy white to light buff spots on feathers, and with a narrow U-shaped brownish black subterminal border, this in turn broadly bordered on outside of each feather with chestnut to liver brown, the chestnut areas with metallic aster purple sheen; rump and upper tail-coverts light yellowish olive brown to ecru olive, laterally dull light glaucous blue, except on longest lateral upper tail-coverts which are orange rufous, feathers with mottlings of brownish black, dull buff, pale buff, and buffy white, these less conspicuous on upper tail-coverts; long middle tail feathers isabella color to light brownish olive, becoming dull buffy olive on lateral feathers, outer half of outer webs—except on outermost feathers—drab, inner webs freckled with chaetura drab and hair brown, all feathers barred on middle portion with black, this broadest on middle tail feathers, and on drab portion of feathers barred with mineral red; wing-quills olive brown, primaries with mottled bars of pale pinkish buff, and secondaries with central portion conspicuously mottled with same buff, inner portions more obscurely so; tertials fuscous black with mottlings of buff and broad edgings on both webs, at least terminally, of sanford brown, this tinging also outer edges of inner secondaries; primary coverts olive brown with shaft mottlings of pale buff, their exposed portions mostly plain; alula similar but heavily mottled with pale dull buff; exposed surfaces of upper wing-coverts light grayish olive to light neutral gray, edge of wing dull creamy white; narrow superciliary stripe and narrow collar on lower

throat above white collar metallic cedar green, like upper hindneck; sides of neck anterior to this metallic mulberry purple; chin and throat metallic dark antique green; jugulum and breast sanford brown to orange rufous with metallic sheen of aster purple, each feather with U-shaped tip of dull black, this broadest at terminal portion of shaft and imparting scalelike appearance; middle of breast brownish black to fuscous black, edges of feathers metallic dull bluish green; sides ochraceous buff with large terminal dark shaft spots that in some lights have metallic bluish or purplish sheen; flanks dull liver brown with metallic aster purple sheen, posteriorly in part dull ochraceous; abdomen and thighs fuscous; lower tail-coverts chestnut to burnt sienna, with longest feathers fuscous, terminally mottled with dull grayish olive; lining of wing light pinkish buff, outer edge buffy white, spotted and mottled with light drab. Bill light greenish yellow; iris dark brown; bare skin surrounding eye bright red; legs and feet brownish gray. *Adult male, winter:* Acquired by complete postnuptial molt. Practically identical with nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Middle of pileum between dark sepia and clove brown, or dark clove brown, barred with dull cinnamon, sides of crown dull cinnamon, finely barred with dark sepia or clove brown; nape between dull vinaceous tawny and onion-skin pink, feathers with narrow scalelike tips of clove brown; lower hindneck chestnut to tawny, this extending to upper part of back, each feather with broad, irregular, V-shaped subterminal marking of dark brown and a pale buff or buffy white tip; back and scapulars brownish black or very dark clove brown, feathers with broad tips of cinnamon brown to russet and broad edgings of cinnamon buff to pinkish cinnamon; rump and upper tail-coverts avellaneous to very dull cinnamon buff or tawny olive, feathers with irregular dark brown T-shaped terminal markings, which on upper tail-coverts become broad bars, and irregular buffy white or pale buff bars; tail much shorter than that of male, middle feathers grayish drab or buffy drab, remaining feathers mostly cinnamon drab with irregular, broken, or often incomplete or mottled bars of fuscous or fuscous black, remaining portions of feathers also mottled with fuscous, and all rectrices margined on inner webs with dull pinkish buff to avellaneous; wing-quills olive brown to dull buffy brown; primaries and secondaries barred with rather broad, though sometimes irregular and mottled, bars of pinkish buff to cinnamon buff, or with dull light buff, outer webs of secondaries more or less mottled with light cinnamon brown to pale buff; tertials mostly dark brownish black, terminally and laterally barred or mottled irregularly with light cinnamon brown and with a few narrow bars of buff, feathers tipped and edged with color of rump; upper wing-coverts fuscous, their tips, edges, and shaft stripes, sometimes also irregular bars, pale buff, buffy white, or cinnamon buff, lesser coverts palest; narrow superciliary stripe dull pale buff with fine dots of fuscous; ear-coverts sayal brown; remainder of sides of head buffy white or dull pale buff, very finely and obscurely dotted with fuscous; chin and throat dull avellaneous or buffy avellaneous; jugulum dull tawny to dull cinnamon, feathers with bars or V-shaped markings of brownish black and broadly tipped with dull buff; lower parts dull buff; sides and flanks dull cinnamon to sayal brown, irregular or V-shaped bars on sides and flanks dark sepia to olive brown; abdomen dull pale buff to dull pinkish buff; lower tail-coverts between ochraceous tawny and tawny, more or less barred or mottled with fuscous, and sometimes tipped with buff; lining of wing drab or buffy drab, barred or mottled with dull pale buff. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but nape paler, more pinkish; entire upper surface much more obscured by buff tips of feathers, thus more blended; markings of jugulum, sides, and flanks also have much broader light edgings and, therefore, are less sharply defined. *Male, first nuptial:* Acquired by wear from first winter. Similar to nuptial adult male, including outer two primaries. *Male, first winter:* Acquired by complete postjuvenile molt, involving all primaries, even the outer two pairs. Like first nuptial male. *Female, first nuptial:* Acquired by wear from first

winter. Like nuptial adult male. *Female, first winter*: Acquired by complete postjuvinal molt, including outer two pairs of primaries. Similar to first nuptial female. *Male, juvenal*: Acquired by complete postnatal molt. Forehead dull cinnamon buff; crown clove brown, median portion more or less spotted or blotched with light snuff brown; back fuscous black with edgings and narrow shaft streaks of pale dull buff and tawny olive; rump fuscous with dull buff and tawny olive edgings of feathers; tail blackish clove brown, more or less irregularly barred with cinnamon and dull buff, outer four pairs of feathers with lateral and median stripes of dull buff, instead of bars; wings hair brown to dark hair brown, quills margined or spotted, particularly on outer webs, with pale buff to pale pinkish buff or cinnamon buff; upper wing-coverts barred or spotted with pale buff to cinnamon buff; superciliary stripe dull cinnamon buff and partly bare; sides of head dull pinkish buff to cinnamon buff; lower parts dull pale pinkish buff to cartridge buff, but jugulum dull cinnamon buff, the latter, with sides and flanks, spotted or streaked with fuscous to hair brown. *Female, juvenal*: Similar to juvenal male, but sides of face all feathered; ear-coverts more brownish; sides of neck and of back more vinaceous. *Natal*: Sides of forehead dull pinkish buff; stripe on each side extending back on side of crown dull cinnamon buff or clay color; middle of crown blackish clove brown, posteriorly with markings of dark snuff brown; upper parts dull cinnamon buff to cinnamon or between tawny and tawny ochraceous, with broad median stripe and two lengthened spots on each side blackish clove brown; sides of head, including

very narrow superciliary stripe, dull pinkish buff, separating this from throat is a rather narrow irregular stripe, broadest behind, of blackish clove brown; throat between cream buff and pinkish buff; jugulum light clay color; remainder of lower parts between cinnamon buff and cream buff.

MEASUREMENTS: *Adult male*: Wing, 212.1–246.1 (average, 234.7) mm.; tail, 400.0–516.1 (453.9); bill (exposed culmen), 28.9–34.0 (31.0); height of bill at base, 15.0–18.0 (16.3); tarsus, 69.1–77.0 (72.2); middle toe without claw, 43.9–53.1 (48.3). *Adult female*: Wing, 186.7–214.1 (202.2); tail, 231.1–265.9 (244.6); bill, 25.9–29.4 (27.9); height of bill, 13.5–16.0 (14.2); tarsus, 57.9–64.0 (61.7); middle toe, 38.1–44.7 (41.7).

RANGE: (See species account.) Most introduced males in North America show white neck-rings; presumably, much of this stock came originally from the Eastern Chinese Ring-necked Pheasant, *Phasianus colchicus torquatus* of s.e. China.

TEXAS: *Resident*: See species account.

NESTING: *Nest*: Situated in more or less open country, in brushy pastures, grass or grain fields, uplands or lowlands, and even occasionally in open woodlands; placed under bush or bunch of grass, in depression in ground, although occasionally in bush or tree; not elaborate structure; composed of leaves of coniferous or deciduous trees, grass, straw, and weed stalks. *Eggs*: 6–20, usually 8–12; ovate to short ovate; glossy; light olive, pale olive gray, greenish white, buff, pale blue, light bluish green, wood brown, or olive buff; without markings; average size, 43.2 × 34.3 mm.

Turkeys: Meleagrididae

TURKEY, *Meleagris gallopavo* Linnaeus

SPECIES ACCOUNT

Common Turkey and Wild Turkey (undomesticated birds) of some authors. A very large, long-legged gallinaceous bird, trimmer than the domestic turkey. *Gobbler*: blackish-barred iridescent greenish bronze; naked bluish head with reddish wattles at base of upper beak, on chin and throat; bristly black tuft ("beard") hanging from chest; long russet-, cinnamon-, buff-, or white-tipped tail; roosterlike spur on leg. *Hen*: smaller; less iridescent; coloration paler due to whitish-tipped body feathers; "beard" thinner and shorter, or lacking. Length, 46½ in. (male), 36¾ (female); wingspan, 5¼ ft. (male), 4½ (female); weight, 17½ lbs. (male), 9 (female).

RANGE: Locally from Arizona, New Mexico, Colorado, Texas, Oklahoma, s. Missouri, Pennsylvania, and New York, south to Oaxaca, Veracruz, and Florida; formerly north to s.e. South Dakota, s. Wisconsin, s. Ontario, and s.w. Maine. Introduced in Germany, New Zealand, and U.S. states of Hawaii, Washington, California, Utah, Montana, Wyoming, and s.w. South Dakota. Much of present distribution is the result of continued stocking both within and outside of original range. Domestic individuals of this species have been taken to practically all countries.

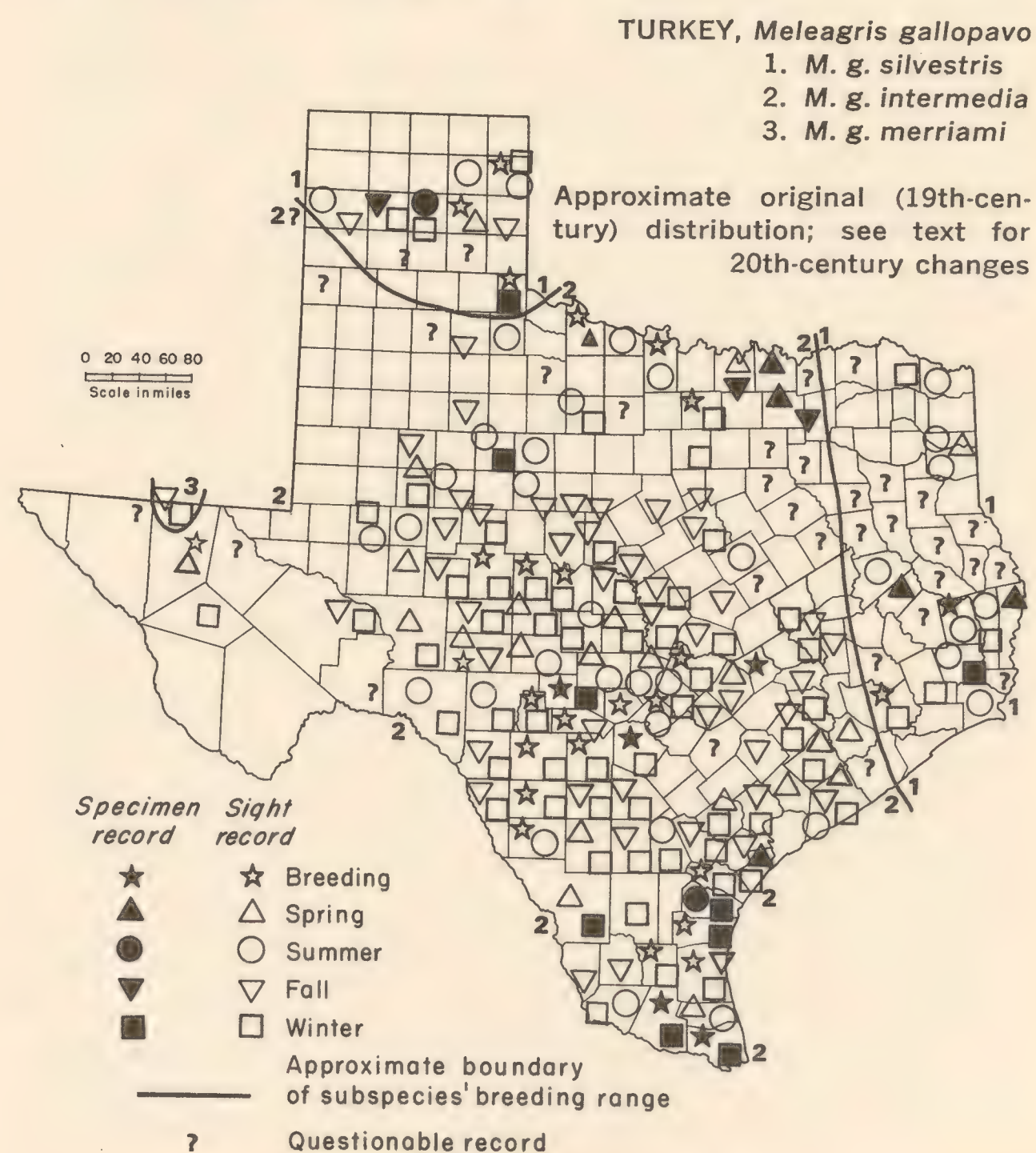
TEXAS: (See map.) *Resident*: Breeds, early Feb. to Aug. (eggs, Feb. 15 to July 25) from near sea level to about 2,500 ft.—a few to 3,700 ft. (see detailed account of Eastern and Rio Grande races); also, from 5,000 to 7,500, perhaps 8,500 ft. (Merriam's). Formerly common over most of eastern three-quarters; scarce in Guadalupe Mts. Now largely extirpated from much of original range; native birds still locally common to fairly common on Edwards Plateau and in south Texas brush country (east to central and lower coasts). More or less reestablished populations locally fairly common to uncommon and irregular (due chiefly to varying success of restocking efforts) in Panhandle and northern and central (naturalized) Trans-Pecos; scarce and extremely-local in most of eastern third.

HAUNTS AND HABITS: Only two species are placed in the Meleagrididae: the ornate Ocellated Turkey, *Agriocharis ocellata*, of the Yucatán Peninsula and the familiar Common Turkey, *Meleagris gallopavo*, of the

eastern United States and northern Mexico. The latter species, in its various cultivated strains, is the major contribution of the New World (more specifically of Mexico) to the world's domesticated birds; in its wild form it is the much acclaimed "king of game birds." The king seems to be especially popular in Texas, where as late as 1970, 27,686 were legally "harvested" within the state.

Appearance, habitat, and habits of the noble Wild Turkey are quite different from those of its conspecific domestic counterpart, and are particularly marked in males. A wild gobbler has an alert eye in a slender blue head, a streamlined body covered with highly burnished feathers, and long legs; the domestic bird has a dull eye sunk into a swollen red head, a flabby body clothed in dirty feathers, and dumpy legs. The former bird runs better than a race horse through woods and flies as lightly as a Ruffed Grouse; the latter can scarcely walk about its pen, much less fly.

Nowadays, the Wild Turkey in most places has been much damaged by clearing of woods, wasteful hunt-



ing, poultry diseases, and interbreeding with domestic strains. Nevertheless, one native race, the Rio Grande, is still widespread and flourishing in Texas. As of the early 1970's, good habitat remains on much of the nearly one-million-acre King Ranch, chiefly Kleberg and Kenedy counties. Here on the live oak and mesquite savannah that constitutes most of the ranch, live many splendid flocks of Rio Grande Turkeys. Throughout the twentieth century, King Ranch personnel have promptly instigated the arrest of trespassing hunters; also the resident game manager shoots any Turkey which shows domestic taint—such as a white tip on a tail feather.

The second area of Rio Grande Turkey concentration is on the Edwards Plateau. Here the habitat is only fair, due to overbulldozing by man and overbrowsing by livestock. Main targets of these destructive forces are trees that furnish food and cover for Turkeys: cedars (chiefly *Juniperus ashei*) and oaks (*Quercus brevilooba*, *Q. laceyi*, *Q. texana*, *Q. virginiana*, others). In addition, plateau Wild Turkeys have been much exposed to domestic blood and diseases.

In parts of the state outside the Edwards Plateau and south Texas, *Meleagris gallopavo* populations, including subspecies, have been changed so drastically that discussion of them and their habitat is best left to the CHANGES section.

The Wild Turkey prefers walking or running to flying; often it covers a four-square-mile area in a day's foraging. To escape danger, it runs—birds have been clocked at 15 m.p.h. on the ground. If forced to fly, it is strong and swift; its tail is spread, and wings beat rapidly at first but become slower after the bird is well on its way. Seldom is it airborne for more than a quarter of a mile; this is an impressive distance considering the bird's bulk, and several such flights in rapid succession generally completely exhaust it. A thorough gleaner, the Turkey overlooks few things as it scratches about on the ground. It consumes pecans, hickory nuts, beechnuts, acorns; fruit of juniper, dogwood, smilax, sumac, grape, and others; seeds of various grasses and grains; and spiders, snails, grasshoppers, beetles, flies, and caterpillars.

Before sunset, birds begin moving to their roost which, if possible, is in a tree growing in or near water. Turkeys usually roost in leafy trees, in contrast to vultures which prefer bare limbs. There is much commotion and exchange of soft *keow*'s during the thirty to forty minutes it takes a flock to settle down. Individuals start low in a tree and ascend in short bursting flights from branch to branch until each bird reaches the interior of a limb at the desired height.

The species is promiscuous. The male doesn't establish a strict territory; instead he drives away other toms from wherever he currently happens to be. To maintain his local superiority, and simultaneously attract his harem, he furiously displays with expanded plumage, fanned tail, and swollen ornamental wattles; this is accompanied by struts, gobbles, and rattling of his drooping wing-quills. Individuals pair only briefly; females

then isolate themselves to tend the clutch, although occasionally two hens share incubating duties. Gobblers are antagonistic until late summer. Then in fall and winter, they form flocks—typically old males congregate exclusive of young toms. Several hens, each with her brood, gather in separate, often quite large, parties.

In spring, gobbling males most vigorously beckon females just after sunrise; a hen often replies with a low quavering *keow keow keow*, which is the general conversation note of the species. A warning note of an aroused, but not overly alarmed, individual is *pit* or *pit-pit*; if danger is imminent, the bird sounds a loud *putt-putt*! Nearby Turkeys, upon hearing this ultimate alarm, dash at top speed for cover.

CHANGES: In Texas, the Wild Turkey, like the Greater Prairie Chicken, has undergone continuous drastic changes in distribution and numbers from historic times into the present.

Although several American Indian tribes apparently valued Turkeys more for their feathers than for their meat, the white man began chewing up great quantities of *Meleagris* flesh just as soon as he landed in North America. It comes as no surprise, therefore, that the very first definite record of any species of bird within the confines of the present state of Texas was of the Wild Turkey; the naturalist with the Long Expedition to the Rocky Mountains noted a flock on August 5, 1820, at a point on the Canadian River thirty miles west of present-day Tascosa (Oldham Co.).

At mid-twentieth century there were still Wild Turkeys in the Canadian's cottonwood (*Populus*) groves but these were transplants of the Rio Grande race; the original Eastern Turkey was here extirpated by hunters and settlers in the 1890's. Apparently the last remnant of indigenous wild birds in far north Texas was slaughtered in Cottle County during 1905. These individuals were on the border line between the natural ranges of the Eastern and Rio Grande turkeys.

As of 1942, there were somewhat less than one hundred Eastern Turkeys in the pine-oak woodlands of the eastern fourth of Texas. Racial purity of these few has been considerably endangered by repeated releases of both nonnative subspecies (Rio Grande, even Florida) and domestic breeds. Since the 1850's, two factors have operated with increasing force to depress the Wild Turkey population. First, settlers brought in pigs, some of which became feral. By 1900, thousands of "razor back" or "piney woods rooter" hogs were plowing up the ground between trees in deep east Texas. These omnivorous animals gobble up prodigious amounts of turkey food—acorns, beechnuts, pecans, etc.—and also consume any eggs or poults they come across. Second, the tradition of nesting-season hunting, when gobbling toms are easy to locate and shoot, has been especially strong in this backwoods area. Beginning in the 1950's, a new detrimental factor came forward. Nowadays, practically all large landholdings in east Texas—outside of four national forests—are controlled entirely by timber corporations. These companies mostly want to grow pine and nothing else; on their tree planta-

tions, oaks and nut-bearing trees are killed, leaving little or no food for turkeys, deer, and squirrels. Feral hogs can survive this treatment, but it is doubtful whether much native wildlife will live if practically all of east Texas is converted into pine plantations.

The Rio Grande Turkey is the only race which has not suffered drastic range reduction within Texas, but it too has undergone big fluctuations in numbers as man changed the landscape and altered his hunting habits.

Merriam's Turkey in Texas was apparently native only to the Guadalupe Mountains. Here it was wiped out by overhunting about 1907. This subspecies was reintroduced in 1928 and subsequently. As of 1971, birds could still be heard occasionally in McKittrick Canyon, according to J. A. Lane.

A dozen Merriam's Turkeys were released in the Davis Mountains near Mount Livermore on March 8, 1932, by J. Stokley Ligon. Descendants of these birds and perhaps later introductions were still present in 1970, according to wildlife biologists of the Texas Parks and Wildlife Department. In fact, Davis Mountains birds may be thriving better than Guadalupe ones.

DETAILED ACCOUNT: THREE SUBSPECIES

EASTERN TURKEY, *Meleagris gallopavo silvestris* Vieillot

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Lower part of tarsus with long, curved, sharp-pointed spur. Head and upper part of neck mostly bare, with only a few little tufts of fuscous or fuscous black feathers, and a few short, slender, blackish bristles; ear-coverts of bristly feathers dull buffy white, tipped with fuscous; hindneck, back, and lesser and median wing-coverts metallic olive green or greenish olive, changing in some lights to grenadine red or flame scarlet, feathers very narrowly tipped with black, this most evident on back posteriorly; lower back, rump, and upper tail-coverts fuscous black, lower back edged with metallic heliotrope gray, rump and upper tail-coverts edged with metallic vinaceous changing anteriorly to metallic green, posteriorly to metallic yellow, and with blue, purple, or violet iridescence; broad tips of feathers of rump black, tips of upper tail-coverts chestnut, longest feathers without iridescence, and narrowly barred with chaetura drab, except on chestnut tips; tail chaetura drab to dull black, numerous and rather narrowly barred with russet or tawny, tip russet or light russet; wing-quills chaetura black, their tips rounded, secondaries shading to hair brown and on inner tertials to grayish buffy brown, inner webs of tertials much mottled with orange cinnamon and buff, primaries and secondaries numerous barred with white or buffy white on both webs, these markings more or less disappearing on outer webs of innermost secondaries, which have slight metallic greenish or orange sheen; greater wing-coverts metallic brownish vinaceous, innermost feathers tipped with black; lining of wing anteriorly fuscous, posteriorly hair brown; anterior lower parts like back; a full brushlike tuft, or "beard," of pendant black bristles, often S-shaped, 8-14 in., on middle of jugulum; abdomen fuscous black, feathers edged with pale buff or buffy white; thighs fuscous to buffy brown, varied with dull buff and dull black; lower tail-coverts fuscous black or black, with subterminal bars of metallic violet or green, and broad tips of chestnut or russet, basally more or less barred with chestnut or russet. Bill basally dull brown, remainder light brown; naked skin of head and neck blue; wartlike or lappet-like excrescences purplish red and whitish; iris dark brown; legs purplish red, feet somewhat darker, their scales outlined with

yellowish white; soles of toes dark brown; claws light or dull brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from adult female in winter. Tarsus with spur much shorter than that of adult male. Head and upper neck mostly naked but with scattered tufts of buffy white feathers; feathers of auriculars as in male; hindneck and mantle, including lesser and median wing-coverts, metallic deep olive changing to vinaceous rufous, each feather with dull brown or chestnut tip and a rather broad dull black subterminal bar; rump and upper tail-coverts chaetura drab, tips of feathers subterminally black and terminally dull chestnut, most of them narrowly barred toward base with chestnut; wings and tail similar to those of male but duller in color, and scapulars, tertials, and innermost secondaries much tinged with tawny, particularly on inner webs; tail chaetura drab, finely barred with russet, and with broad subterminal unbarred band and broad tip of russet; lower parts similar to upper surface, but tips of feathers broadly russet, becoming chestnut on flanks; "beard" or pendant-tuft of bristly feathers on jugulum much thinner and shorter (4-6 in.) than in adult male; abdomen light chaetura drab with buff tips; crissum like that of male; thighs dark hair brown with buff brown bars and spots. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female but somewhat darker. *Male, fourth nuptial:* Similar to nuptial adult male, but "beard" shorter; tarsal spur straight, not so sharp, and shorter than hind toe without claw. *Male, third nuptial:* Similar to fourth nuptial male, but "beard" thinner, often not so long; spur duller and stouter. *Male, second nuptial:* Acquired by wear from second winter. Similar to third nuptial, but spur shorter, less pointed, knoblike; "beard" shorter (about 4 in.). *Male, second winter:* Acquired by complete postnuptial molt. Like second nuptial. *Male, first nuptial:* Acquired by wear from first winter. "Beard" short (1-4 in.), more or less square across tip; spur only rudimentary knob. Otherwise similar to adult female but larger; outermost two primaries of each wing pointed instead of rounded. *Male, first winter:* Acquired by postjuvenile molt, complete except for outermost two pointed primaries of each wing retained from juvenile. Similar to first nuptial male. *Female, second nuptial:* Acquired by wear from second winter. Similar to nuptial adult female, but "beard" shorter. *Female, second winter:* Acquired by complete postnuptial molt. Similar to second nuptial female. *Female, first nuptial:* Acquired by wear from first winter. Similar to second nuptial female, but outermost two primaries of each wing pointed instead of rounded; "beard" very short or wanting. *Female, first winter:* Acquired by postjuvenile molt, complete except for outermost two primaries of each wing retained from juvenile. Like first nuptial female. Similar to first winter male but smaller; "beard" wanting. *Juvenal:* Acquired by complete postnatal molt. Mantle hair brown or walnut brown, feathers with edges and shaft streaks of russet or cinnamon, tips of dull white, and large black subterminal areas; scapulars sayal brown, finely mottled, spotted, or barred with black on outer webs; wing-quills hair brown, barred or finely spotted with dull white or cinnamon buff, chiefly on outer webs but on both webs of tertials; lower surface fuscous with dull pale buff or buffy white shaft streaks and broader tips; tail fuscous, barred with pinkish cinnamon or dull pale buff; "beard" wanting. *Natal:* Pileum dull pinkish cinnamon, with irregular spots of fuscous, clove brown, or bister; back similar but light markings somewhat lighter though with more dark brown, and with broad central stripe of clove brown or bister; sides of head dull cinnamon buff; auricular spot of clove brown or bister; chin and throat pale cinnamon buff; middle of breast and abdomen pale buff or buffy white; sides and flanks drab or light hair brown mixed with buffy white or pale buff.

MEASUREMENTS: *Adult male:* Wing, 482.1-570.0 (average, 518.9) mm.; tail, 349.0-435.1 (392.4); bill (exposed culmen), 32.0-38.1 (35.3); height of bill at base, 16.0-21.6 (17.8); tarsus, 148.1-183.9 (163.3); middle toe without claw, 72.9-85.1 (80.7). *Adult female:* Wing, 405.1-430.0 (418.8); tail, 309.1-334.0 (319.0); bill, 27.9-33.0 (31.0); height of bill, 13.7-15.0

(14.2); tarsus, 119.9–141.0 (130.0); middle toe, 65.0–71.9 (67.8).

RANGE: Locally from Oklahoma to Pennsylvania and New York, south to s.e. Texas and s. Georgia; formerly north to s.e. South Dakota, s.e. Ontario, and s.w. Maine, west to s.e. Colorado and n.w. Texas. Large portions of present range are result of restocking with both wild races and domestic strains.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 600 ft. in east Texas; formerly 1,700 to 3,700 ft. in northern Panhandle. Collected in east Texas, north to Upshur (date unknown), east to Newton, south to Hardin, west to Trinity cos. Scarce and local. Formerly taken (preserved?) in Panhandle, in Potter, Carson, Randall (ca. 1910), and Childress cos.

NESTING: *Nest*: In swampy bottomlands, dry slopes, or woodlands, well concealed in thicket or other undergrowth; in hollow in ground; composed of leaves, straw, and grass. *Eggs*: 8–26, usually 11–12; ovate or short ovate to elongate ovate; smooth but not glossy; cream white to cream buff, sprinkled with rounded dots of various shades of dark brown; average size, 62.7 × 44.7 mm.

RIO GRANDE TURKEY, *Meleagris gallopavo intermedia* Sennett

DESCRIPTION: *Adult male, nuptial plumage*: Similar to *M. g. silvestris*, but wing and tail somewhat shorter; tips of upper tail-coverts, of lower part of rump, and of tail feathers much paler—about cinnamon or dull cinnamon buff. *Adult female, nuptial*: Upper tail-coverts as in male but averaging somewhat darker, though much paler than in *M. g. silvestris*; also edges of feathers on lower parts much paler—on breast buffy white or cinnamon, on flanks and crissum cinnamon or cinnamon buff.

MEASUREMENTS: *Adult male*: Wing, 463.0–485.1 (average, 471.9) mm.; tail, 337.1–400.0 (370.3); bill (exposed culmen), 35.1–36.6 (35.6); height of bill at base, 18.0–19.6 (18.8); tarsus, 158.0–169.9 (163.1); middle toe without claw, 77.0–82.0 (79.2). *Adult female*: Wing, 382.0–420.1 (399.0); tail, 265.9–307.1 (291.3); bill, 26.4–33.0 (30.7); height of bill, 14.7–17.5 (15.7); tarsus, 124.0–138.9 (130.3); middle toe, 64.5–71.9 (68.3).

RANGE: W. and c. Oklahoma, south locally to n.w. Coahuila, extreme s.e. San Luis Potosí, and Tamaulipas. Present range

in Oklahoma largely result of restocking; naturalized in Panhandle Texas.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 2,500 ft. Collected north to Wilbarger, southeast to Refugio, Kenedy, and Cameron, west to Webb and Kerr cos.; formerly east to Collin and Lee (eggs) cos. Apparently no specimen from introduced stock in Panhandle. Locally fairly common.

NESTING: Similar to that of *M. g. silvestris*, but average egg size, 62.2 × 46.5 mm.

MERRIAM'S TURKEY, *Meleagris gallopavo merriami* Nelson

DESCRIPTION: *Adult male, nuptial plumage*: Similar to *M. g. intermedia* but larger; tips of feathers on lower rump, upper tail-coverts, and tail feathers buffy white or pinkish buff, decidedly paler than in both *intermedia* and *silvestris*. Bill dull brown; bare neck and head dull bluish violet; wattle on base of bill red, washed with creamy white, and basally pale ochraceous buff; iris dark brown; legs dull red. *Adult female, nuptial*: Likewise paler than *intermedia* or *silvestris*; tips of upper tail-coverts, rump, and rectrices buffy white, light ochraceous salmon, or light pinkish cinnamon; edges of feathers on most of lower parts much paler than in *intermedia*, on breast white or buffy white, on posterior parts buffy white or dull pale pinkish buff.

MEASUREMENTS: *Adult male*: Wing, 505.0–536.9 (average, 519.9) mm.; tail, 378.0–432.1 (400.3); bill (exposed culmen), 35.1–40.4 (38.4); height of bill at base, 19.0–23.6 (20.6); tarsus, 161.0–179.1 (166.4); middle toe without claw, 80.0–90.4 (85.1). *Adult female*: Wing, 409.9–469.9 (437.6); tail, 327.9–394.0 (349.2); bill, 32.0–36.1 (33.8); height of bill, 16.0–19.0 (17.3); tarsus, 119.9–158.0 (131.3); middle toe, 68.1–75.9 (71.9).

RANGE: Locally in mountains from s. Colorado, south to n.e. Sonora; formerly in n. Chihuahua, and Guadalupe Mts. of Trans-Pecos Texas. Present range in Trans-Pecos is result of restocking (Guadalupe Mts.) and naturalization (Davis Mts.).

TEXAS: *Resident*: Altitudinal breeding range, about 5,000 to 7,500 ft., probably to 8,500 ft. in Guadalupe Mts. No specimen of original or introduced stock.

NESTING: Similar to that of *M. g. silvestris*, but average egg size, 65.8 × 47.3 mm.

Cranes: Gruidae

WHOOPING CRANE, *Limnogeranus americanus* (Linnaeus)

SPECIES ACCOUNT

Grus americana of A.O.U. check-list, 1957 (see Appendix A). Tallest North American bird, standing 5 ft. or slightly more. *Adult*: a large white crane with blunt, somewhat daggerlike yellowish bill; reddish skin on crown, darker on face and lower jaw; plumes form neat rounded "bustle" over tail. In flight, with slender neck and long blackish legs extended, reveals black-tipped wings. *Immature*: similar, but head entirely feathered and plumage tinged with rusty, mostly on head, neck, and back. Length, 51 in.; wingspan, 7¼ ft.; weight, 12 lbs.

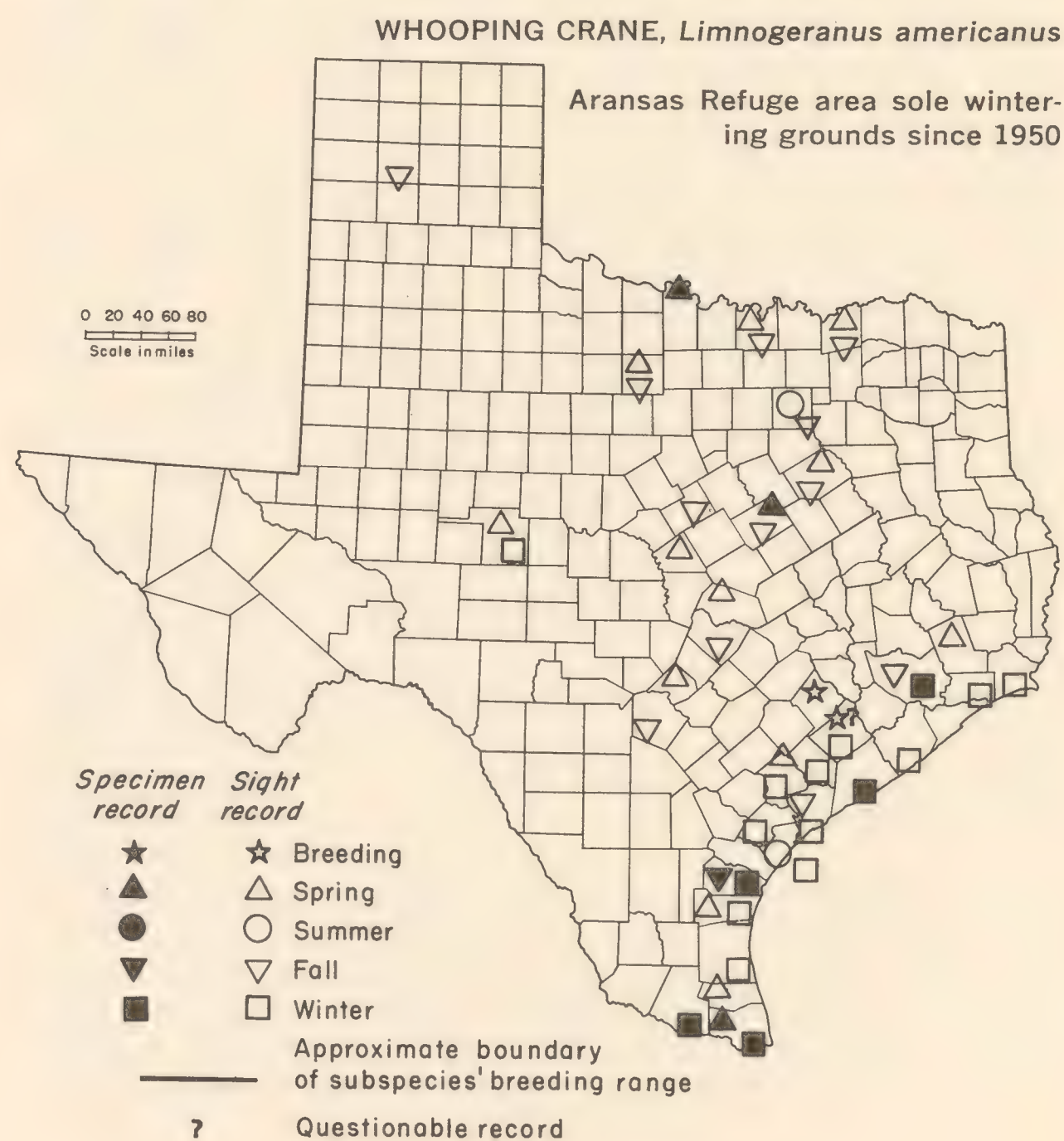
RANGE: Wood Buffalo Nat. Park in s. Mackenzie and n. Alberta; formerly from s. Mackenzie and Manitoba, south to North Dakota and Iowa, also c. coastal prairie of Texas and s.w. Louisiana. Winters on Aransas Nat. Wildlife Refuge and adjacent Matagorda and St. Joseph islands in Aransas, Refugio, and Calhoun cos., Texas; formerly from U.S. Gulf states to Chihuahua (probably), Jalisco, Guanajuato, San Luis Potosí, and n. Tamaulipas. One winter record each from New Mexico and New Jersey.

TEXAS: (See map.) *Breeding* (formerly): Four 19th-century records: extreme southern Wharton Co. (nest discovered, and young with parents, 1867, 1869, and 1878, J. D. Mitchell); Colorado Co., near Eagle Lake (nest with 2 eggs, date unknown, recorded by Oliver Davie in *Nests and Eggs of North American Birds*, 3rd ed., June 24, 1889). Two 20th-century attempts: Aransas Nat. Wildlife Refuge (2 eggs laid by semicaptive bird in 1949 failed to hatch; 1 egg laid by the same female on Apr. 20, 1950, hatched on May 24, but young bird soon perished, fide J. O. Stevenson). One or two individuals occasionally summer on Aransas Refuge. *Migration*: Late Mar. to late Apr.; mid-Oct. to late Nov. (extremes: Feb. and Mar. 5, May 6; July 25—next earliest Aug. 29, early Jan.). Rare but regular—formerly common—over central portions of state, west to Amarillo and San Angelo, east to about 96th meridian—formerly to Texarkana and Beaumont. *Winter*: Mid-Nov. to late Mar. Formerly fairly common and generally distributed near Gulf coast. Since 1950, Aransas Nat. Wildlife Refuge and vicinity (central coast) has served

as sole wintering grounds for this crane; during 1970–71, a total of 57 individuals wintered here.

HAUNTS AND HABITS: North America is the precarious home for only two of the world's fourteen splendid Gruidae; in the late 1930's and 1940's, the number almost became one when the wild and wary Whooping Crane was nearing extinction. Breeding grounds for the species are now confined to suitable portions of the eleven-million-acre Wood Buffalo National Park in southern Mackenzie and northern Alberta. Isolated in a shallow pond in the muskeg, a pair builds its nest: a flat rough platform of weeds and rushes. The birds uproot plants around this mass for material, thus creating a moat around their finished nest.

Each fall, Whoopers fly 2,600 miles to the oak savannahs, marshes, salt flats, and bays of Aransas National Wildlife Refuge on Texas' central Gulf coast; this 55,000-acre refuge on Blackjack peninsula and about 7,000 acres on adjacent Matagorda and St. Joseph islands are currently the sole wintering grounds for wild Whooping Cranes. Territoriality and strong family bonds are maintained even during this season.



Adults, remaining with their offspring, protect an approximate 450-acre plot from intrusions of other Whooping Cranes. Herein lie the food, watering, preening, and bathing areas, and, often, at least a portion of the pond where they fly to roost (cranes sleep while standing in shallow water). However, some single birds, pairs, or family groups will habitually roost in the same bay where they go crabbing in late afternoon; individuals simply wade more and more slowly and finally stop still as night comes on. Families associate harmoniously at feeding plots provided by the refuge.

Magnificent in flight, the Whooping Crane moves with slow, but powerful and regular, wing-beats. To take off, it runs a few steps along the ground, then surges into the air with deep downstrokes followed by quick upward flicks of the wings. As is typical of cranes, the neck and legs extend gracefully from the body. Migrants in V-formation or straight lines fly high in the sky, their trumpeting at times announcing their passage. This call issues from a long windpipe. That of one specimen measured fifty-eight inches, twenty-eight of which were coiled in the bird's sternum cavity; comparable figures for a Sandhill Crane were twenty-six and nine inches. More aquatic than the Sandhill, the long-gaited Whooper strides widely about the feeding areas where it probes on muddy or grassy margins of the water or wades in shallows. Omnivorous, it eats crabs, especially the blue (*Callinectes sapidus*), shrimp, frogs, small fish, crayfish, roots and tubers of plants, also acorns, sorghum and other grains.

The spectacular courtship dance of the Whooping Crane begins as weather warms on the winter flats of Aransas but reaches full frenzy on Canadian nesting grounds. Usually early in the morning or at dusk, one or more pairs gather on a grass-grown knoll and here exchange bows, stiff-legged leaps and turns, wing flapping, other agitated gyrations, and loud trumpet notes.

The beautiful wild call of the Whooping Crane is a buglelike *ker-loo! ker-lee-oo!* There is none of the Sandhill's rattle, possibly because the Whooper's extra long, much coiled windpipe deepens and smooths out the sound. Bugling, like dancing, is fairly frequent on the Aransas Refuge, especially in late winter.

CHANGES: Unlike the bison, Eskimo Curlew, Passenger Pigeon, and other wonders of North American fauna, the Whooping Crane was never enormously abundant within historic times. According to Robert Porter Allen in his thorough study *The Whooping Crane* (1952, National Audubon Society, research project no. 3), there were only between 1,300 and 1,400 Whoopers alive in any given year between 1700 and 1860, or possibly 1870.

Between 1870 and 1893, ranchers, farmers, and gunners eliminated most U.S. crane habitat and the birds themselves. Last Mexican record of a Whooper was in 1903. By 1918, the species was apparently reduced to only three wintering pockets—about 16 birds on the King Ranch in Kleberg and Kenedy counties, Texas; approximately 25 on and near the present Aransas Ref-

uge; and 6 migrants in the brackish marshes of southwestern Louisiana. In addition, there were some 12 resident, sometimes breeding, individuals at White Lake, Louisiana. The final Whooper seen on the King Ranch was in 1937. In Louisiana, there were several unconfirmed sightings of from 1 to 5 Whoopers near the Gueydan-Lacassine Refuge in October, 1959, but the official last bird in that state left via helicopter on March 11, 1950. This individual, whose name was Mac, was flown to Texas for a breeding experiment at Aransas Refuge. He died before he could do any breeding.

Recent changes in the status of the Whooping Crane can be dated from December, 1937, when the U.S. Fish and Wildlife Service established Aransas National Wildlife Refuge on Blackjack peninsula, mostly in Aransas County, at a point on the Texas coast about equidistant from the Louisiana and Mexico borders. This refuge, since enlarged somewhat, then contained 47,000 acres. During the winter of 1937–38, the world Whooper count was 11 resident birds in Louisiana, 18 or 19 wintering in Texas, and 1 captive, a badly wounded bird at Gothenburg, Nebraska. Between 1937 and 1950, the Whooper population in Louisiana died out.

Since 1950, when apparently all the world's wild and free Whooping Cranes have wintered on and adjacent to the Aransas Refuge, there has been a slow, but mostly steady, climb in their numbers. U.S. Fish and Wildlife figures show 31 birds in 1950, 28 in 1955, 36 in 1960, 44 in 1965, and 57 in 1970. The cranes are counted weekly each winter by skilled personnel at Aransas.

According to Ernie Kuyt, wildlife biologist, Wood Buffalo National Park, Northwest Territories, Canada, there were 89 Whooping Cranes alive on planet Earth as of June 11, 1971. The 66 wild individuals were augmented by a zoo bank of 23 captives—1 female at San Antonio Zoo, Texas; 3 males at New Orleans Audubon Zoo, Louisiana; and 19 kept for breeding at the U.S.F.W. Patuxent Research Refuge, Laurel, Maryland.

The increase in Whoopers of recent years is encouraging, but the species is still far from safe. In fact, 1972 saw a dangerous setback when 13 wild individuals were lost. Waters surrounding Aransas Refuge are increasingly polluted with industrial and agricultural chemicals—including mercury and chlorinated hydrocarbons. A major oil spill could come at any time from the numerous wells, pipelines, tanks, tankers, and barges in the vicinity. Mud from oyster shell dredging smothers marine food used by Whoopers. In winters since the mid-1960's, the big cranes have fed much within two 100-acre fenced plots planted to grains, sedge tubers, and vegetables; these refuge plantings probably reduce Whooper consumption of contaminated crabs, but crowding of the birds at food plots increases the risk of parasites and disease. In spite of educational campaigns in newspapers and elsewhere, an occasional ignorant Snow Goose hunter still shoots a Whooper. Hazards are endless.

During the 1960's and into the 1970's, thousands of binocular-, telescope-, and camera-toting visitors have viewed the far-famed big white birds from the deck of the *Whooping Crane*, and other excursion boats, on the Intracoastal Canal, which runs the full length of Aransas Refuge on its seaward side. Most of these persons realize that each visit may be the last for them or the cranes, for America or the world.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Crown, lores, base of lower jaw, and fore part of cheeks mostly bare but with bristlelike black feathers, more numerous anteriorly; short triangular spot posterior to bare space on hind part of lower jaw and a two-inch patch on occiput slate color; primaries, except their bases and inner webs of innermost feathers, dull black; primary coverts and alula chaetura black or fuscous black; remainder of plumage all white. Bill wax yellow or dull green, but pink or tinged with brown at base; bare skin on crown carmine or dull orange; lores and malar streak blackish red or orange, due to the numerous black hairlike feathers growing on reddish skin; iris red or gamboge yellow (however, only yellow eyes seen in Texas—EDITOR); legs and feet bluish black to dark gray; soles of anterior toes dull rose. *Adults, winter:* Acquired by complete postnuptial molt in two periods. Like nuptial adults. *Third winter:* Acquired by complete postnuptial molt. Identical with nuptial adults. *Second nuptial:* Acquired by partial prenuptial molt. Similar to adults but often with a few buff or cinnamon buff feathers on head, neck, or wings; head usually not so extensively bare. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *First nuptial:* Acquired by partial prenuptial molt. Similar to second nuptial, but with much mottling and suffusion of cinnamon and buff, chiefly on head, neck, and wings; anterior portion of head more feathered; head itself entirely or almost wholly feathered. *First winter:* Acquired by wear from juvenal, with which it is practically identical, except for somewhat paler colors. *Juvenal:* Acquired by complete postnatal molt. Head wholly feathered; entire plumage, except dull black primaries and primary coverts, white but much mottled above and below with cinnamon buff or pinkish cinnamon, these markings most numerous on top of head and on back and scapulars, some feathers of mantle somewhat darker, approaching sayal brown. Bill dull wax yellow, basally dull pink, terminally brownish black; iris yellow; legs and feet dull black or brownish black. *Natal:* Mostly buff, somewhat darker above; lower surface paler buff. Bill flesh color above, darker below; small white spot on maxilla.

MEASUREMENTS: *Adult male:* Wing, 576.1–629.9 (average, 604.3) mm.; tail, 205.0–245.1 (224.3); bill (exposed culmen), 129.0–147.1 (139.7); height of bill at base, 33.0–37.6 (35.1); tarsus, 275.1–320.0 (289.8); middle toe without claw, 97.1–118.1 (106.7). *Adult female:* Wing, 534.9–610.1 (588.7); tail, 194.1–238.0 (220.2); bill, 132.1–148.1 (136.1); tarsus, 260.1–300.0 (281.2); middle toe, 101.1–114.0 (107.2).

TEXAS: *Breeding* (formerly): See species account. *Migration:* Specimens: Clay Co., Dick Worsham Ranch (1 on Apr. 14, 1904, and 5, ca. 1908, R. L. More; 2 prior to 1927, Charles Stroup); McLennan Co. (1 in Apr., 1899, J. K. Strecker); McLennan Co., North Bosque River (1 prior to 1900, Baylor University collection). In addition, there have been sightings reported from Potter, Young, Cooke, Fannin, Bowie (date unknown), Tarrant (1920), Dallas, Navarro, Tom Green, Hamilton, Lampasas, Williamson, Travis, Liberty, Comal, and Bexar cos. *Winter:* Taken in Jefferson (ca. 1919), Harris (1893, 1912), Matagorda (1886), Nueces (1891–1904), Cameron (1887–1903), and Hidalgo (1893) cos. There have been sightings from Chambers, Galveston, Brazoria, Wharton, Jackson, Victoria, Calhoun, Refugio, Aransas, Kleberg, Kenedy, and Wilbacy cos. (see species account).

NESTING: *Nest:* In marsh or on prairie; on ground, often in water; well-built, bulky platform 2 to 3 ft. in diameter; made of rushes, weeds, flags, and marsh grass; lined with dry grass. *Eggs:* 1–3, usually 2; elliptical ovate or elongate ovate; texture of shell somewhat rough, but slightly glossy; greenish brown, light brownish drab, cream buff, or olive buff, with numerous spots of dark brown or buff and shell markings of gray; average size, 98.3 × 62.2 mm.

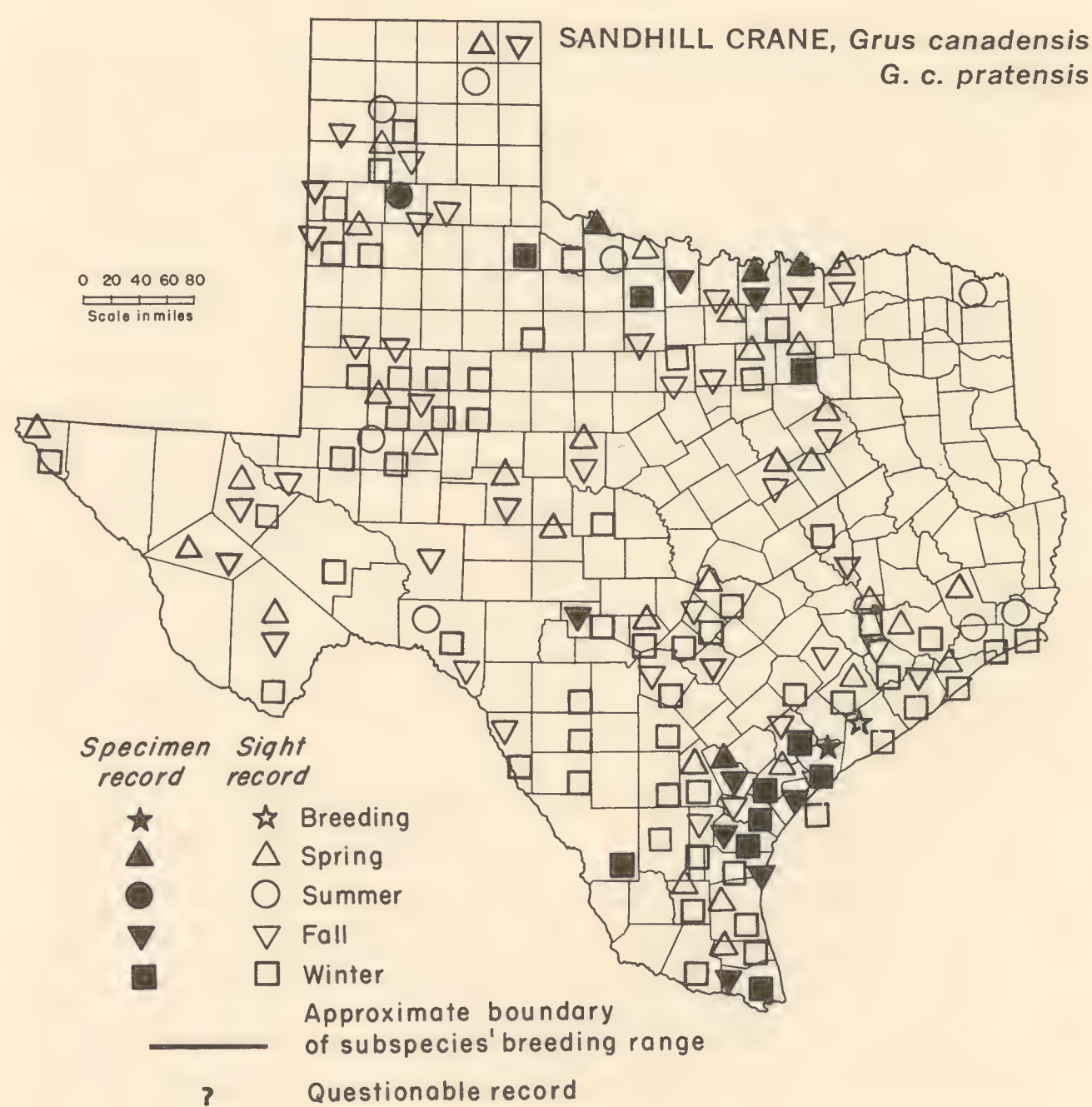
SANDHILL CRANE, *Grus canadensis* (Linnaeus)

SPECIES ACCOUNT

A tall crane with neat rounded "bustle" over tail. *Adult:* gray with buffy white cheeks and chin; has bare red skin on forehead. Some individuals stained rusty. *Immature:* brownish with no red on forehead. Length, 34–48 in.; wingspan, 5½–7 ft.; weight, 8–11½ lbs.

RANGE: N.e. Siberia, n. Alaska, and n. Baffin Island, south to n.e. California, Colorado, and Michigan; and from Alabama and Georgia to s. Florida; also Cuba and Isle of Pines. Northern races winter locally from c. California and Texas to n. Baja California, Jalisco, Distrito Federal, and Quintana Roo (including Cozumel).

TEXAS: (See map.) *Breeding* (formerly): Two 19th-century records: Jackson-Calhoun county line, between Carancahua and Keller bays (eggs obtained, 1893, J. D. Mitchell); southwestern Matagorda Co. (nest located, 1895, Mitchell). *Migration:* Early Mar. to late Apr.; late Sept. to early Dec. (extremes: Jan. 23, June 8; Aug. 4, late Dec.). Abundant to uncommon over western two-thirds, as well as on and near upper coast; scarce to rare over interior east Texas (east roughly to 97th meridian). *Winter:* Late Nov. to late Mar. Locally abundant to fairly common in middle and southern Panhandle, south Texas brush country, and along coast; scarce to rare in most of Trans-Pecos and



in central portions; apparently does not overwinter in northern Texas east of 100th meridian.

HAUNTS AND HABITS: The Sandhill Crane is a large and stately, horizon-gray bird of grassy tundra, wild prairie, extensive marshland, open pine savannah, and, in recent years, big ranches and farms. The species has two disjunct breeding distributions. Northern races nest from northeastern Siberia and Alaska to the northwestern United States; southern subspecies reside very locally in extreme southeastern United States and in Cuba. Flying in V-formation or long columns and bugling their unforgettable *gur-roo*'s, waves of Sandhills in fall move south to winter grounds. During cool months in Texas, the *grullas* (as cranes are called by most Mexicans and some Texans) seek Panhandle and west Texas plains and coastal grasslands and fields.

Flight of this and other cranes is exceedingly graceful and powerful; each downstroke of the wing is terminated by a peculiar up-curling of the primary feather tips. Wing-beats are slow, but drive the Sandhill through the air swiftly and for long-sustained periods. Migrants, unlike geese, fly mostly by day and sometimes move at great altitudes, the birds appearing as mere specks in the sky. Like hawks, cranes often use thermal updrafts to lift and carry them. Typical silhouette of *Grus canadensis* in flight shows fully extended neck and legs.

On the ground, this bird is just as impressive. With long strides, it walks calmly, often traversing a mile or more in a day's foraging. Food and feeding haunts depend on season. On and near the breeding grounds, the Sandhill wades in shallows or works at margins of lakes and marshes; during migration and in winter, it feeds almost entirely on fields and plains, frequently very dry ones. Its diet consists chiefly of tubers (in Texas, especially wild onions), berries, seeds; to a lesser extent, mice, frogs, crayfish, and insects. In fall, Sandhills are drawn to stubble fields, where they fatten on waste grain.

After a day's food gathering, Sandhills, in family parties or other groups, fly to the nearest suitable water hole or lake. They alight just before dark and spend the night standing in shallow water. Presumably this roosting arrangement offers the cranes protection, since a coyote or other predator splashing toward a group of these wary birds would probably wake them in time for a getaway. Apparently many migrant and wintering Sandhills, unlike the more aquatic Whooping Crane, frequent water only during the night.

Beginning on the winter grounds and continuing into, and sometimes beyond, the breeding season, both male and female Sandhills perform fantastic dances. These are often even more spectacular than those of the Whooping Crane, since the Sandhill is numerous enough to engage in communal displays. Individuals assemble, usually on a grassy knoll, and at times in large flocks (100 or more birds); here with bursting energy they repeatedly bow, leap into the air with wings partially extended, turn, wheel, and prance. Generally, much calling accompanies the acrobatics.

The rolling call of the Sandhill Crane, uttered from both ground and air, is a sonorous, somewhat rattling *gur-roo* or *gar-oo-oo-oo*; this mellow vocalization is very frequently heard in Texas, even though nowadays the species breeds far away from the state. Other notes of this crane are rather Canada Goose-like.

CHANGES: Historic and recent changes in the status and distribution of the Sandhill Crane have not been nearly so drastic as they have been with the Whooping Crane. However, it should be noted that the Sandhill has not nested within Texas during the twentieth century. As far as the record shows, Sandhill Cranes never did breed much in Texas. In fact, H. C. Oberholser could find only two nestings that seem authentic (see species account).

During the past century, the comparatively southern-nesting races—the Western, *G. c. tabida*, and Florida, *G. c. pratensis*—have been slowly declining. Only the arctic-breeding Little Brown, *G. c. canadensis*, is still doing well. Its advantage is that its enemies are still chiefly wolves, foxes, and jaegers, instead of man, his civilization, guns, and poison.

In Texas, numbers of Sandhills are comparable to those of one hundred years ago, but nowadays a huge majority of the individuals belong to *G. c. canadensis*. These flocks contemporary Texas bird watchers are mighty happy to see, since even a Little Brown Sandhill is a majestic big gray bird!

DETAILED ACCOUNT: THREE SUBSPECIES

LITTLE BROWN SANDHILL CRANE, *Grus canadensis canadensis* (Linnaeus)

Lesser Sandhill Crane of many authors.

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt (body down only). Occiput and hindneck mouse gray to quaker drab, light mouse gray to light quaker gray, or pallid neutral gray to pale mouse gray; back and upper surface of wings drab, hair brown, or mouse gray, feathers with paler edges; tail and secondaries between mouse gray and neutral gray; primaries, including at least terminal third of shafts, fuscous black; primary coverts hair brown; chin and sides of face pale dull buff or buffy white; throat dull light mouse gray; remainder of lower surface including lining of wings between drab and mouse gray or light mouse gray; upper and lower parts often adventitiously stained with tawny, ochraceous, or cinnamonous. Maxilla grayish olive at base, tinged with purplish gray and grayish blue toward tip; mandible basally drab gray, terminally grayish olive and pale grass green; bare papillose space of crown begonia rose, bittersweet pink, or reddish orange, anteriorly drab gray or grayish; iris crimson, grenadine, red, pale orange, or orange-yellow; legs and feet dull greenish black to dark olive. *Adults, winter:* Acquired by complete postnuptial molt in two periods. Similar to nuptial adults. *Third winter:* Acquired by partial postnuptial molt. Becomes adult in this plumage. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but wing-coverts in part still cinnamon rufous as in earlier plumages. *Second winter:* Acquired by partial postnuptial molt. Crown bare; occiput and most of neck gray as in adults, but upper wing-coverts in part tipped with light cinnamon rufous or tawny. *First nuptial:* Acquired by partial prenuptial molt. Similar to second winter, but crown only partially bare, not so reddish, and smoother. *First winter:* Acquired, at age of about 90 days, by partial molt from juvenal. Similar to juvenal, but head less feathered, showing some red, and more carunculated or rugose; plumage everywhere with less tawny

or russet; resembling first nuptial, but crown not so extensively bare, less rugose, and with less red; plumage with more tawny or russet. Iris hazel; legs and feet greenish black. *Juvenal*: Acquired by complete postnatal molt. Similar to adults, but feathered head, with back and remainder of upper parts, much mixed on tips of feathers with russet or tawny; primaries more deeply blackish; secondaries and secondary wing-coverts tipped with tawny to tawny brown; lower parts more or less mixed with tawny. Bill flesh color to pinkish buff and vinaceous cinnamon, darker at base; iris dark brown; legs flesh color to pinkish buff. *Natal* (this plumage of this race not seen in Texas): Middle of pileum, hindneck, and back chestnut or burnt sienna; lateral portion of upper parts and sides ochraceous tawny; rest of lower parts dull grayish white. Bill dull flesh color; iris dark brown; legs and feet dull flesh color.

MEASUREMENTS: *Adult male*: Wing, 442.0–498.1 (average, 474.8) mm.; tail, 155.9–186.9 (167.1); bill (exposed culmen), 89.9–112.0 (98.3); height of bill at base, 21.1–27.9 (24.1); tarsus, 186.2–228.1 (199.9); middle toe without claw, 65.0–77.0 (70.4). *Adult female*: Wing, 424.9–475.0 (451.1); tail, 150.1–165.1 (161.0); bill, 82.0–95.0 (90.2); height of bill, 21.1–25.9 (23.4); tarsus, 154.9–212.1 (184.9); middle toe, 65.0–71.9 (69.3).

RANGE: N.e. Siberia, n. Alaska, and Banks Island to n. Baffin Island, south to s. Alaska and Southampton Island. Winters locally from c. California and Texas to n. Baja California, Jalisco, Guanajuato, and Puebla.

TEXAS: *Migration*: Collected northwest to Swisher (June), east to Cooke and Dallas (Feb. 18), south to Bee and Cameron cos. Common. *Winter*: Taken along coast northeast to Calhoun, southwest to Cameron cos. Locally abundant.

WESTERN SANDHILL CRANE, *Grus canadensis tabida* (Peters)

Greater Sandhill Crane of many authors.

DESCRIPTION: *Adults, nuptial plumage*: Similar to *G. c. canadensis* but larger; shafts of primaries usually ivory white throughout, instead of black for at least terminal third.

MEASUREMENTS: *Adult male*: Wing, 501.9–590.0 (average, 548.4) mm.; tail, 157.5–207.0 (182.3); bill (exposed culmen), 132.1–169.9 (144.8); height of bill at base, 26.4–40.1 (32.3); tarsus, 231.1–265.9 (244.3); middle toe without claw, 84.8–90.9 (86.6). *Adult female*: Wing, 469.9–577.1 (524.8); tail, 164.1–186.9 (175.5); bill, 120.6–152.9 (136.9); height of bill, 26.2–

35.3 (30.7); tarsus, 215.1–240.0 (227.5); middle toe, 75.9–83.3 (79.7).

RANGE: Locally from c. British Columbia to Michigan, south to n.e. California and Colorado. Winters locally from c. California and Texas to n. Baja California, Jalisco, Distrito Federal, and Quintana Roo (including Cozumel).

TEXAS: *Migration*: Collected north to Wilbarger and Clay, south to Cameron, west to Kerr cos. Locally fairly common. *Winter*: Taken in Victoria, Refugio, Nueces, and Webb cos. Uncommon.

NESTING: (This race has never nested in Texas.) *Nest*: In marshes, on wet prairies, sometimes islands in ponds; rather flat, loosely constructed, often in water, but bulky; composed of grasses, roots, weeds, rushes, tules, other vegetation, and mud; lined with rushes or grass. *Eggs*: 1–3, usually 2; ovate or elongate ovate to cylindrical ovate; grayish yellow, drab gray, ecru drab, or pale vinaceous drab; blotched and spotted with dark brown, reddish brown, various shades of gray, and with isabella color; average size, 96.3 × 61.2 mm.

FLORIDA SANDHILL CRANE, *Grus canadensis pratensis* Meyer

DESCRIPTION: *Adults, nuptial plumage*: Similar to *G. c. tabida*, but wing and bill shorter, tarsus somewhat longer; plumage darker both above and below. Similar to *G. c. canadensis* but decidedly larger; upper and lower parts darker; shafts of primaries usually ivory white throughout. *Natal*: Probably similar to *G. c. canadensis*.

MEASUREMENTS: *Adult male*: Wing, 486.9–525.0 (average, 508.0) mm.; tail, 183.1–206.0 (191.8); bill (exposed culmen), 127.0–143.0 (132.6); height of bill at base, 25.9–31.5 (28.7); tarsus, 235.0–263.9 (255.0); middle toe without claw, 77.0–86.6 (80.2). *Adult female*: Wing, 450.1–485.1 (473.2); tail, 153.9–182.1 (170.4); bill, 119.1–135.9 (125.5); height of bill, 24.9–31.0 (24.9); tarsus, 228.1–241.0 (235.0); middle toe, 71.9–80.0 (76.2).

RANGE: Locally from Alabama to s. Georgia, south to s. Florida; formerly to c. coast of Texas and s. Louisiana. Casual in winter in s.e. Texas.

TEXAS: *Breeding* (formerly): See species account. *Winter*: Two specimens: Calhoun Co., s.w. Matagorda Island (Nov. 19, Dec. 12, 1936, A. R. Hines; identified by H. C. Oberholser).

NESTING: Similar to that of *G. c. tabida*, but average egg size, 93.7 × 59.9 mm.

Limpkin: Aramididae

LIMPKIN, *Aramus guarauna* (Linnaeus)

SPECIES ACCOUNT

A large, long-necked swamp-and-marsh wader with long, very slightly decurved, brown-tipped yellowish bill; long, dark greenish gray legs; big webless feet. Olive brown above and below, liberally white-streaked on head, neck, mantle, breast, and flanks. Length, 26¾ in.; wingspan, 3½ ft.; weight, 3 lbs.

RANGE: S.e. Georgia to s. Florida, also Cuba, Isle of Pines, Jamaica, and Hispaniola; and from Oaxaca, Veracruz, and Yucatán, south locally through Central America and South America (east of Andes) to c. Argentina and Uruguay, also Trinidad.

TEXAS: *Casual:* Two collections (see detailed account) and four careful sightings from extreme upper coast: Jefferson Co. (Alligator Bayou Marsh, about 4 mi. north of Port Arthur, Oct. 23, 1938, Bessie M. Reid; southwestern corner of county, 2 on Jan. 19, 1936, Reid); Chambers Co. (Cove, July 25, 1935, A. K. McKay; near High Island, 2 on Jan. 19, 1936, Reid). One specimen at Brownsville (see detailed account).

HAUNTS AND HABITS: The Limpkin, solitary member of the exclusively New World Aramididae, perhaps links the crane and rail families. Its name derives from its unique limping pace; a bird walks jerkily with high steps, neck bent forward, and a continual upward hitching of its tail. In the United States, it inhabits freshwater marshes and swamps—wooded or open—from Okefenokee Swamp in extreme southeastern Georgia through Florida. Chief, but not strict, requirements appear to be dense high vegetation or nearby trees and shrubs for nesting and seclusion and an abundant supply of large freshwater snails (especially the apple snail, *Pomacea*), although Limpkins eat a variety of other aquatic food. The shallow nest of rushes or sticks is either secluded in reeds or tufts of tall grass or is secured—sometimes up to seventeen feet—in trees and bushes. Occasionally, like herons, several pairs nest in close proximity.

Rising from its marsh with a quick spring, the Limpkin flies low with slow steady strokes accented with cranelike jerks of its wings. Flight is infrequent and, especially when flushed, seldom sustained. It alights and walks about in trees as easily as do herons. Considerably less wary than its rail relatives, *Aramus gua-*

rauna often perches atop a bush and feeds in the open beside a marsh or thicket; mainly crepuscular and nocturnal, it is best observed at dusk and dawn. However, where the species is numerous, as at Wakulla Springs, Florida, some, perhaps most, individuals are also active by day. In addition to snails, the Limpkin probes mud with its long bill for freshwater mussels; it also eats frogs, small reptiles, worms, insects, and a few seeds. The bird's dependence upon aquatic life, particularly apple snails, has been exaggerated. The senior editor recalls a well-adjusted Limpkin which, in 1955, lived in a very dusty woodland near the village of Tres Picos on the arid Pacific slope of Chiapas, Mexico.

The mournful wail of the Limpkin, likened to the cry of a child lost in the swamp, has been described as *kur-r-ee-ow*, *kur-r-ee*, *kur-r-ee*, *kr-ow*, *kr-ow*. The piercing cry begins usually at sunset and often continues through the night. Individuals also call in daytime, especially during cloudy weather. Birds also utter a variety of clucking notes.

DETAILED ACCOUNT: TWO SUBSPECIES

FLORIDA LIMPKIN, *Aramus guarauna nictus* (Meyer)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Forehead buffy brown, streaked with olive brown; occiput olive brown, entirely streaked with light buffy brown and dull white; hindneck clove brown, with broad shaft streaks or hastate spots of white; mantle rather brownish deep olive, feathers with mostly concealed large hastate shaft spots of white; rump and upper tail-coverts bister, without markings; tail and wing-quills vandyke brown, exposed surface of tertiaries and secondaries like back but unmarked, secondaries with little or no distinct white area along shaft at base; wing-coverts like back and with same broad white shaft spots; sides of head dull light brownish buff, obscurely streaked with fuscous or drab; chin and upper throat buffy white, latter obscurely and narrowly streaked with fuscous; remainder of throat and jugulum between olive brown and buffy brown with broad partially concealed shaft streaks of white; breast and abdomen sepia, feathers with mostly concealed very broad hastate spots of white; lower tail-coverts plain bister; lining of wing olive brown with broad hastate shaft spots of white or buffy white. Bill greenish yellow, light brown with orange tinge, or yellowish flesh color, but on terminal portion darker, changing to dull black or dark dull brown at tip; iris hazel, greenish slate color, or dull pale brown; legs and feet plumbeous or greenish slate color; claws dark brown, blackish slate, or black. *Adults, winter:* Acquired by complete postnuptial molt. Coloration practically same as that of nuptial adults. *First nuptial:* Acquired by complete prenuptial molt. Identical with nuptial adults. *First winter:*

Acquired by wear from juvenal, with which it is practically identical. *Juvenal*: Acquired by complete postnatal molt. Similar to adults, but texture somewhat softer. White markings on back smaller. Bill yellowish green but darker terminally; legs and feet slate gray.

MEASUREMENTS: *Adult male*: Wing, 307.1–342.9 (average, 319.5) mm.; tail, 127.0–152.9 (139.2); bill (exposed culmen), 116.1–139.9 (123.2); height of bill at base, 18.5–22.1 (20.1); tarsus, 119.1–143.0 (131.3); middle toe without claw, 86.6–99.1 (91.7). *Adult female*: Wing, 286.0–317.0 (303.8); tail, 125.0–142.0 (134.4); bill, 108.0–125.0 (115.3); height of bill, 18.5–20.6 (19.6); tarsus, 104.9–132.1 (121.7); middle toe, 73.9–94.5 (84.6).

RANGE: S.e. Georgia (Okefenokee Swamp) to s. Florida; also Cuba and Isle of Pines, Jamaica, and Hispaniola. Casual straggler in extreme s.e. Texas.

TEXAS: *Casual*: Two specimens (preserved?), both from Jefferson Co.: Port Arthur (ca. 1900, taken by unknown hunter); Alligator Bayou Marsh, 3 mi. north of Port Arthur (found dead on road, Mar. 19, 1938; remains identified by H. C. Oberholser).

MEXICAN LIMP KIN, *Aramus guarauna dolosus* Peters

Race not in A.O.U. check-list, 1957.

DESCRIPTION: *Adults, nuptial plumage*: Similar to *A. g. pictus*, but with much more white on secondaries, broad white area extending along shaft of these feathers to point on outer web for a length of sometimes $3\frac{1}{2}$ to $5\frac{1}{2}$ in.

MEASUREMENTS: *Adult male*: Wing, 315.0–338.1 (average, 325.4) mm.; tail, 137.9–156.9 (145.3); bill (exposed culmen), 116.1–125.0 (120.6); height of bill at base, 20.1–22.6 (21.4); tarsus, 117.1–142.0 (130.3); middle toe without claw, 85.1–95.5 (89.2). *Adult female*: Wing, 303.0–305.1 (303.8); tail, 135.9–141.0 (137.9); bill, 106.9–119.1 (112.0); height of bill, 17.5–19.6 (18.5); tarsus, 113.0–123.0 (119.1); middle toe, 83.1–86.1 (84.3).

RANGE: Oaxaca to Yucatán, south to Costa Rica. Accidental in extreme s. Texas.

TEXAS: *Accidental*: One specimen: Cameron Co., Brownsville (May 23, 1889, Field and E. C. Greenwood; Sennett collection of American Museum of Natural History).



PLATE 10: Greater Prairie Chicken, *Tympanuchus cupido*, next to blooming *Baptisia*

Rails: Rallidae

KING RAIL, *Rallus elegans* Audubon

SPECIES ACCOUNT

A large rail of fresh marshes; has long, slender, slightly decurved, brownish yellow bill; moderately long, brownish gray legs; and big feet which resemble those of a chicken. Blackish-spotted rusty brown above with whitish loreal streak and chin; cinnamon breast; very dark gray posterior under parts with conspicuous whitish bars on sides, flanks, and crissum. Length, 15¼ in.; wingspan, 22¼; weight, 14 oz.

RANGE: C. Minnesota and s. Ontario to New York and Massachusetts (rarely), south to c. Texas and s. Florida; also Cuba and Isle of Pines. Northern race winters chiefly from s.e. Texas and Florida to Guanaquato and Veracruz.

TEXAS: (See map.) *Breeding*: Late Jan. to Sept. (eggs, Feb. 6 to Aug. 12; downy chicks from Mar. 5 to Aug. 29) from near sea level to about 3,700 ft. Common to fairly common on and near upper coast; scarce and local in northeastern Panhandle (nesting likely) and across north central Texas, south to Waco; rare and very irregular on central coast, in San Antonio vicinity, and in El Paso region. *Migration*: Feb. 23 to May 31; July 26 to Nov. 26. Common on upper coast; uncommon on central coast; locally scarce to rare through remainder of eastern two-thirds west to 101st meridian; casual through Trans-Pecos. *Winter*: Mid-Nov. to mid-Mar. Common to fairly common on upper coast; uncommon to scarce on central coast, irregularly reaching Rio Grande delta; rare and local in remainder of eastern two-thirds.

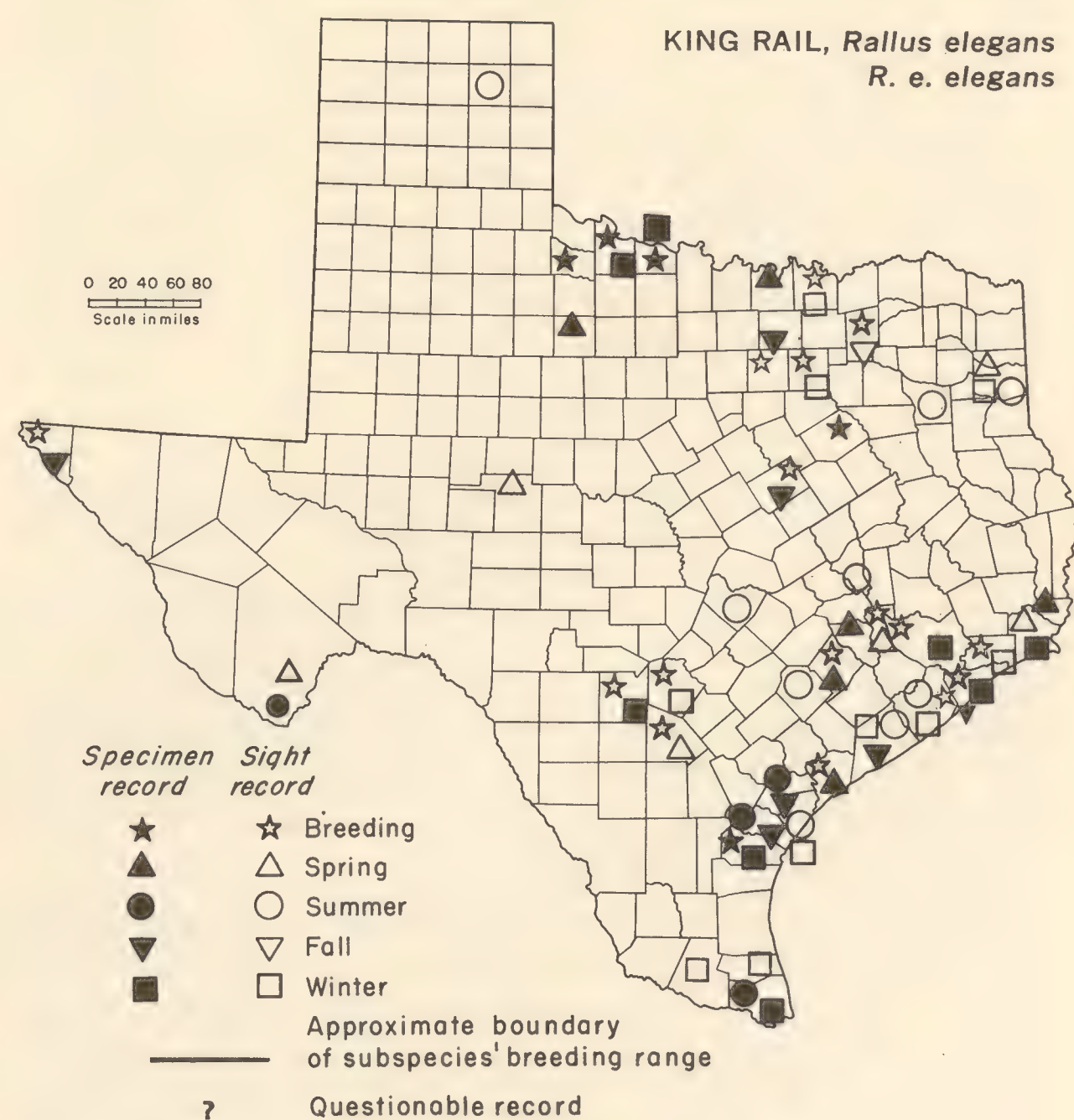
HAUNTS AND HABITS: Of the 132-member Rallidae, 9 occur in Texas; in this Lone Star group, the King Rail is the largest *Rallus*. Habitat preferences help distinguish the present species from the Clapper Rail, which is very similar and almost as large: Kings, although occurring near the Gulf of Mexico, remain in freshwater marshes and swamps; Clappers inhabit coastal salt marshes. Only in intermediate brackish ponds and streams, where there is some overlap of these birds, is there much probability of confusing the two.

A typical member of its family, the elusive, solitary King Rail is more often heard than seen in its thick, reedy or grassy haunts. Chiefly terrestrial, a disturbed

individual quickly and quietly weaves its way on foot to the densest part of the marsh; as a last resort it flushes, less often it swims and dives to escape. Flight of a flushing bird is hesitant and weak; legs dangle and stubby wings, appearing inordinately short for its body size, beat rather slowly. If traveling any distance, neck and legs extend straight out in front and back. Amid rank vegetation, where it climbs about with ease, it forages for mollusks, insects, slugs, leeches, crayfish, seeds, and other vegetable matter. If a cultivated field is adjacent to its marsh, a bird ranges there for waste grain and grasshoppers.

Calls of the King Rail include a deep grunting *bup-bup*, *bup-bup-bup* (also described as *umph*, *umph*, etc.), a *kick*, *kick-kick* or *creek-creek-creek*, and *chuck*-ing noises that resemble a human clucking a "get-up" command to a horse. Rails are generally noisiest at dawn and dusk.

CHANGES: As recently as the mid-1950's, the irrigated fields of rice so characteristic of the region between Eagle Lake and Houston, Texas, were swarming with thousands of White-faced Ibis, Fulvous Tree Ducks,



and King Rails. The year 1958 was the last good one for them. Beginning in 1959, rice farmers have been treating their seeds liberally with mercury fungicides, plus various of the even more vicious chlorinated hydrocarbons. In one year the duck plunged from very common to almost zero, ibis numbers were reduced, and the rail almost wiped out. Some of the long-winged Fulvous Tree Ducks apparently fled to Mexico and Florida, but the King Rails of Texas rice fields seem mostly to have gone to the happy hunting ground. Individuals survive locally in less poisoned marshes.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN KING RAIL, *Rallus elegans elegans* Audubon

DESCRIPTION: *Adults, nuptial plumage (dark phase):* Acquired by partial prenuptial molt. Crown clove brown, plain or with narrow edgings of bister; remainder of upper parts fuscous black to clove brown, feathers, including those of scapulars and tertials, narrowly edged on hindneck, and broadly elsewhere, with light brownish olive, saccardo umber, clay color, or tawny olive, rump and upper tail-coverts duller; tail clove brown, broad margins sepia; wing-quills warm fuscous to sepia; lesser and other upper wing-coverts russet or rufescent snuff brown; supraloral streak and spot on lower eyelid buffy white; lores and cheeks fuscous or dull olive brown, slightly mixed with dull white or pale dull buff; chin and upper throat white; lower throat, sides of neck, jugulum, and breast light or dark cinnamon; sides, flanks, and crissum chaetura drab or chaetura black, often more or less washed with bister, rather broadly barred with white or buffy white; thighs drab, broadly barred with pale buff or buffy white; lining of wing hair brown and bister, narrowly barred or spotted with white or buffy white. Mandible and edge of maxilla yellow; tip of both, also culmen, dark brown; iris red, hazel, russet, or light yellow; legs and feet smoke gray, mouse gray, or yellowish brown tinged with olive. *Adults, nuptial (light phase):* Resembling dark phase, but anterior upper surface lighter, with paler feather edgings; wing-quills tinged with olive; superciliary stripe light buff; lower sides of head pale buff with gray tinge; chin and throat white or pale buff; posterior lower surface light buff. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adults, but colors darker and richer, light edgings of feathers broader. *First nuptial:* Acquired by partial prenuptial molt. Similar to adults in winter. *First winter:* Acquired by partial postjuvinal molt. Similar to first nuptial, except colors somewhat duller, and worn wing-quills of juvenal still retained. *Juvenal:* Upper parts similar to dark phase of nuptial adults, but duller and usually darker because of narrow light edgings of feathers, some of which are more grayish; throat and jugulum cinnamon buff or pinkish cinnamon with spots of light hair brown or drab; breast dull white, much spotted with hair brown and fuscous; abdomen pinkish buff with similar markings; sides and thighs mostly hair brown or fuscous, somewhat mixed with dull buff and bars of buffy white; crissum white or pale cinnamon buff with large spots of dull black. Maxilla slate black, cutting edges ecru drab; mandible ecru drab, becoming drab at tip; iris tawny ochraceous; legs and feet broccoli brown to hair brown posteriorly; claws drab, but slate gray at base. *Natal:* Dull black with metallic dark green sheen on upper parts.

MEASUREMENTS: *Adult male:* Wing, 159.0–177.0 (average, 163.3) mm.; tail, 59.9–72.4 (67.8); bill (exposed culmen), 57.9–65.5 (62.5); height of bill at base, 13.0–14.2 (13.7); tarsus, 52.1–64.0 (58.2); middle toe without claw, 50.5–59.9 (55.3). *Adult female:* Wing, 147.1–162.1 (154.2); tail, 59.9–70.1 (64.3); bill, 50.0–63.0 (61.7); height of bill, 10.9–13.5 (12.4); tarsus, 49.5–57.9 (54.1); middle toe, 46.0–55.9 (50.8).

RANGE: Identical to that of species with exception of Cuba and Isle of Pines.

TEXAS: *Breeding:* Collected north to Wilbarger, east to Navarro and Orange (nesting very likely), south to Nueces cos. *Migration:* Collected north to Cooke, east to Galveston, south to Cameron, west to El Paso cos. *Winter:* Taken north to Wilbarger and Wichita, east to Jefferson, south to Nueces and Cameron, west to Medina cos.

NESTING: *Nest:* In freshwater marshes in high grass, reeds, or small bush; on or near ground, usually just above water, fastened to upright stalks of vegetation; platform composed of grass, weeds, and stems of various water plants; lined with dry grass. *Eggs:* 6–16, usually 8–11; ovate; dull white, cream buff, or pale olive buff; dotted with reddish brown, vinaceous drab, and lilac; average size, 40.9 × 29.9 mm.

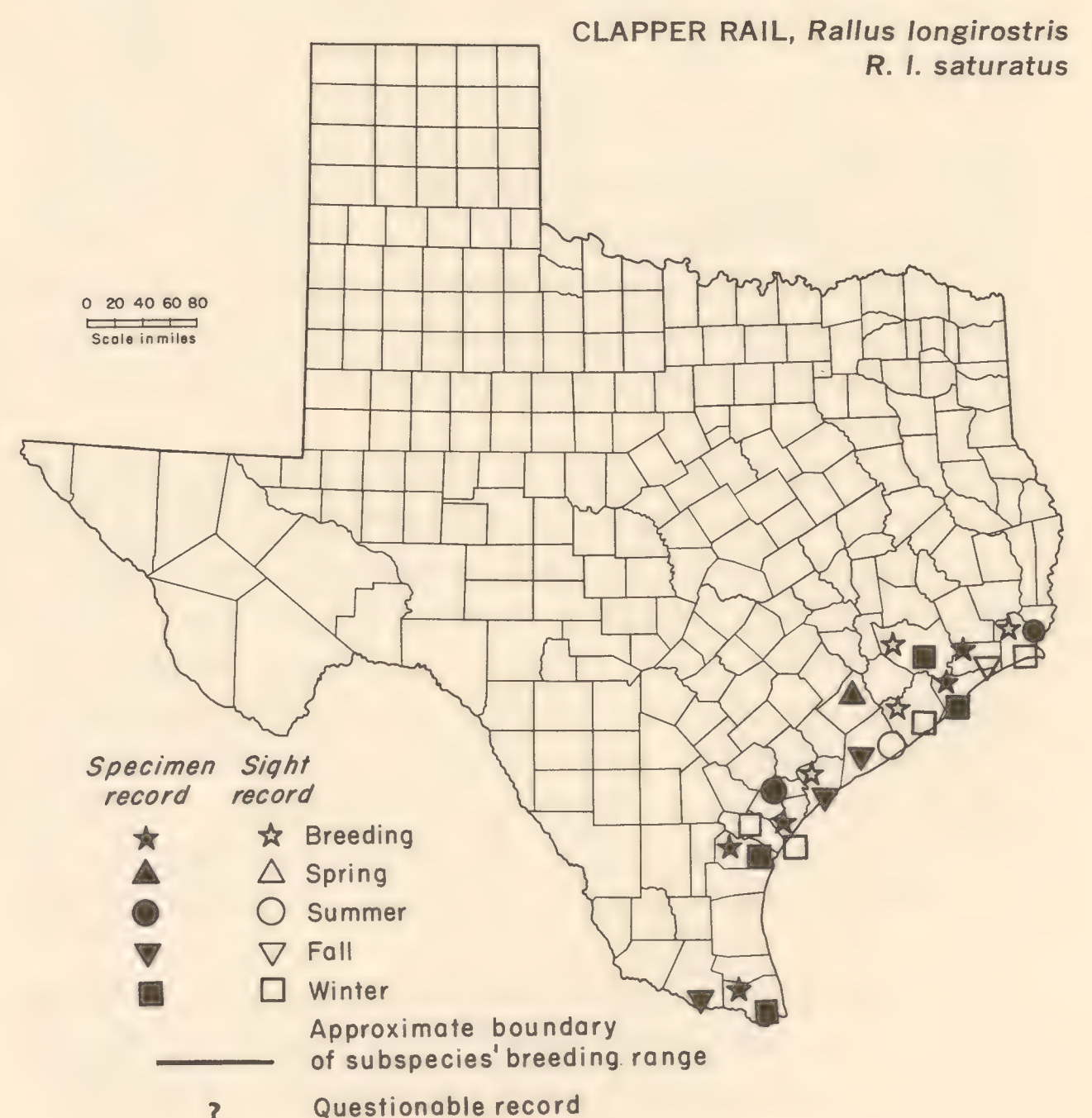
CLAPPER RAIL, *Rallus longirostris* Boddaert

SPECIES ACCOUNT

A large, long-billed rail, usually of salt marshes. Resembles the slightly bigger King Rail, but is grayish olive brown (little or no rusty) above; grayish on side of head fading to pale brownish (not cinnamon) on breast; has less distinct whitish bars on dark gray sides, flanks, and crissum. Length, 13¼ in.; wingspan, 20.

RANGE: Coasts of c. California, south to Baja California, Nayarit, Ecuador, and n.w. Peru, and from Connecticut to Texas, Mexico, Central America (probably), and s.e. Brazil; also inland, in marshes of Salton Sea (California), lower Colorado River Valley in California and Arizona, and State of México and Tlaxcala.

TEXAS: (See map.) *Resident:* Breeds, late Feb. to Sept. (eggs, Apr. 13 to late Aug.; chicks just out of nest as early as Mar. 22) just above sea level. Common to uncommon along coast. *Vagrant:* Nonbreeders occasionally wander a short distance inland; individuals



have reached Wharton and Hidalgo cos. (see detailed account).

HAUNTS AND HABITS: Rough cackles of the Clapper Rail are a distinctive saltmarsh sound; a boat whistle, clapping of hands, or other sudden noise usually provokes loud impulsive responses from this vocal but nonetheless reclusive bird. Along the Gulf of Mexico, as elsewhere, prime Clapper habitat is coastal salt marshes thickly grown to reeds, rushes, and grass, especially saltgrass (*Spartina*). However, high wind tides often destroy Clapper nests and may force a few birds inland to the King Rail's freshwater marshes. Like others in its family, the present species keeps largely to itself.

The Clapper seldom flies. If threatened, it prefers to escape by running silently and rapidly through thick vegetation. When pressed, it sometimes flushes with labored wing-beats and dangling legs, as if by great effort, and soon drops again into the marsh. It is, however, capable of sustained, rather swift flight and swims and dives readily. The Clapper works marsh edges, narrow ditches, or mud flats, where it probes with its long bill for fiddler and other crabs, other crustaceans, mussels, snails, worms, and a few insects. As it walks, it bobs its head and hitches its tail which, when held high, shows off the white under coverts. This large rail leaves conspicuous, widely spaced (some 10 inches apart), chickenlike tracks. In localities where they are not molested, the Clapper can become quite tame. Connie Hagar likes to relate that in the days prior to World War II—before progress changed everything—one or two Clapper Rails would often stride in from nearby marshes to stroll about inside the U.S. Post Office at Rockport, Texas.

The Clapper Rail most frequently sounds its staccato *kek-kek-kek-kek-kek*, etc., at dusk or just before a storm, but in spring birds often cackle at intervals throughout the night. Individuals also utter single *kek*'s and other grunting noises.

DETAILED ACCOUNT: ONE SUBSPECIES

LOUISIANA CLAPPER RAIL, *Rallus longirostris saturatus* Ridgway

DESCRIPTION: *Adults, nuptial plumage (light brown phase):* Acquired by partial prenuptial molt. Pileum dull sepia; remainder of upper parts olive brown to dark olive brown, feathers broadly edged with light brownish olive; tail olive brown with similar edgings; wing-quills warm fuscous; tertials and scapulars centrally clove brown with broad light brownish olive edgings; lesser wing-coverts saccardo umber to rufescent snuff brown, much duller and less rufescent than in the King Rail, *Rallus elegans*, these feathers with rather lighter margins; supraloral stripe buffy white; feathered part of lower eyelid grayish white; sides of head dull neutral gray, darker and rather more brownish on lores; chin buffy white; jugulum and breast light pinkish cinnamon or dull pinkish cinnamon; abdomen very pale buff or buffy white; sides and flanks chaetura drab, or between fuscous and buffy brown and rather broadly barred with dull white; crissum similar but longest feathers mostly white; lining of wing chaetura drab or hair brown, barred or finely spotted with dull white. Bill mostly clay color or reddish yellow, but culmen slate black or dark brown, tip of mandible slate; inside of mouth yellow; bare part of eyelids

dull white; iris raw umber, russet, raw sienna, light yellow, or orange; legs and feet drab to broccoli brown, but ankle joint tinged with orange; claws dark brown or clay color. *Adults, nuptial (dark brown phase):* Similar to light brown phase, but centers of feathers on back and scapulars very dark brown or black. *Adults, nuptial (light gray phase):* Similar to light brown phase, but feathers of back and scapulars with moderately light, somewhat grayish brown centers and broad edgings of clear gray. *Adults, nuptial (dark gray phase):* Similar to light gray phase, but back and scapulars much darker, feathers with very dark brown or blackish centers, edgings of feathers much the same as in light gray phase or somewhat darker. *Adults, nuptial (gray-breasted phase):* Similar to dark brown phase, but cinnamon of jugulum and breast replaced by dull smoke gray, almost clear gray, or, at most, only slightly washed with cinnamon or cinnamon buff; sides, flanks, and crissum dark hair brown. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adults, but colors darker and richer, light edgings of feathers broader. *First nuptial:* Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to first nuptial but somewhat duller; wing-quills still retained from juvenal. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts duller and plainer; anterior lower parts with only a trace of ochraceous buff, lower throat and jugulum washed with dull gray or brown; median portion of breast and abdomen mostly white; sides of jugulum, of breast, and of body darker than in adult and dull brownish gray; flanks mostly gray or drab gray with much narrower and less regular and inconspicuous whitish bars. Iris vandyke brown. *Natal:* Above black with greenish metallic gloss; below brownish black with slight greenish gloss anteriorly; middle of abdomen blackish clove brown.

MEASUREMENTS: *Adult male:* Wing, 140.5–163.1 (average, 150.4) mm.; tail, 57.9–68.1 (63.8); bill (exposed culmen), 55.6–69.1 (61.7); height of bill at base, 11.9–13.5 (12.7); tarsus, 47.0–55.1 (50.8); middle toe without claw, 42.9–52.6 (47.8). *Adult female:* Wing, 131.0–153.9 (141.2); tail, 55.9–66.0 (60.7); bill, 55.1–64.0 (59.7); height of bill, 10.9–12.2 (11.7); tarsus, 41.9–52.6 (47.8); middle toe, 38.1–47.0 (43.7).

RANGE: Coastal salt marshes from s. Texas to s.w. Alabama.

TEXAS: *Resident:* Collected along coast northeast to Jefferson, southwest to Cameron cos. *Vagrant:* Three specimens outside breeding range: Wharton Co., Lissie (2 on May 9, 1927, F. C. Clarkson); Hidalgo Co., Edinburg (Nov. 8, 1932, Stanley Mulaik).

NESTING: *Nest:* In salt marshes on coasts, occasionally in inland field; usually concealed by overhanging grasses, built on ground under drifted trash or in tussocks of grass; composed of reeds and marsh grass; lined with fine grass. *Eggs:* 4–13, usually 8–11; ovate; rather glossy; clay color or buff; spotted or blotched with shades of reddish brown, and with shell markings of gray and lavender; average size, 41.9 × 29.2 mm.

VIRGINIA RAIL, *Rallus limicola* Vieillot

SPECIES ACCOUNT

A medium-sized rail with long, slender reddish brown bill tipped with brown; brownish legs; if flushed, reveals russet forewings. *Adult:* closely resembles King Rail, but about half its size; has gray (not brownish) cheeks. *Immature:* dark-green-glossed blackish above; brownish black below with whitish wash medially on throat, breast, and belly, and vague whitish bars on flanks. Length, 9½ in.; wingspan, 13¾; weight, 2¾ oz.

RANGE: British Columbia to c. Manitoba and Nova Scotia, south locally through United States to Baja

California and Valley of México; in high mountains of Ecuador; and from c. Chile and c. Argentina to Strait of Magellan. Migratory in Canada and n. United States.

TEXAS: (See map.) *Summer:* June 20 to July 31. Rare to casual and exceedingly local over state south to 29th parallel. Young located: Dallas Co., Mountain Creek Lake (2 young with 2 adults, July 25, 1937, Mrs. E. E. Winford); Navarro Co., Corsicana (young with adult, July 23, 1931, Connie Hagar; 4 young banded, July 23–31, 1931, Mrs. R. N. Molloy). Actual records of eggs, nests, or chicks lacking. *Migration:* Mid-Mar. to early May; Sept. to early Nov. (extremes: Feb. 22, June 3; July 23, Dec. 26). Locally uncommon (mainly along coast) to rare through most of state. *Winter:* Nov. 27 to Feb. 22. Uncommon to scarce near coast.

HAUNTS AND HABITS: Except for its gray cheeks, the Virginia Rail appears like a meadowlark-sized King Rail. North of Texas, birds nest in freshwater or semi-brackish marshes and swamps. Well concealed in cattails or sedges, the loosely woven nest—usually suspended over water—is fastened to stalks of vegetation. By night, migrants move silently to their wintering grounds. Transients pass locally throughout the state (a scarcity of records points up their extreme reclusiveness); in cool months, solitary birds seclude themselves primarily in salt marshes along the Gulf coast.

Flight of a migrating Virginia is swift and powerful. It usually flies rather low, thus many fatalities result from collisions with buildings and utility wires. On these long flights, the bird extends its neck and legs straight out and moves with steady wing-strokes. At this time its silhouette is more graceful than when it flushes awkwardly from a marsh—legs dangling and wings struggling. When alarmed, rather than take to the air, most rails—strong-legged and slender-bodied

—prefer to wind silently through mazes of reeds and rushes. With its long, slightly downcurved bill, a foraging Virginia pulls earthworms and insect larvae from the mud; it also eats slugs, snails, small fish, and even climbs agilely in thickets, shrubbery, and low trees to get seeds and berries.

The nuptial call of the Virginia Rail is a vibrant, metallic *kid-ick, kid-ick, kid-ick* which sounds like a hammer striking an anvil. Other peculiar vocalizations include series of piglike grunts descending in pitch, a piercing *spee* or *see*, loud *eh-eh*'s, and other strident squeals. Birds are usually silent off the breeding grounds.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN VIRGINIA RAIL, *Rallus limicola limicola* Vieillot

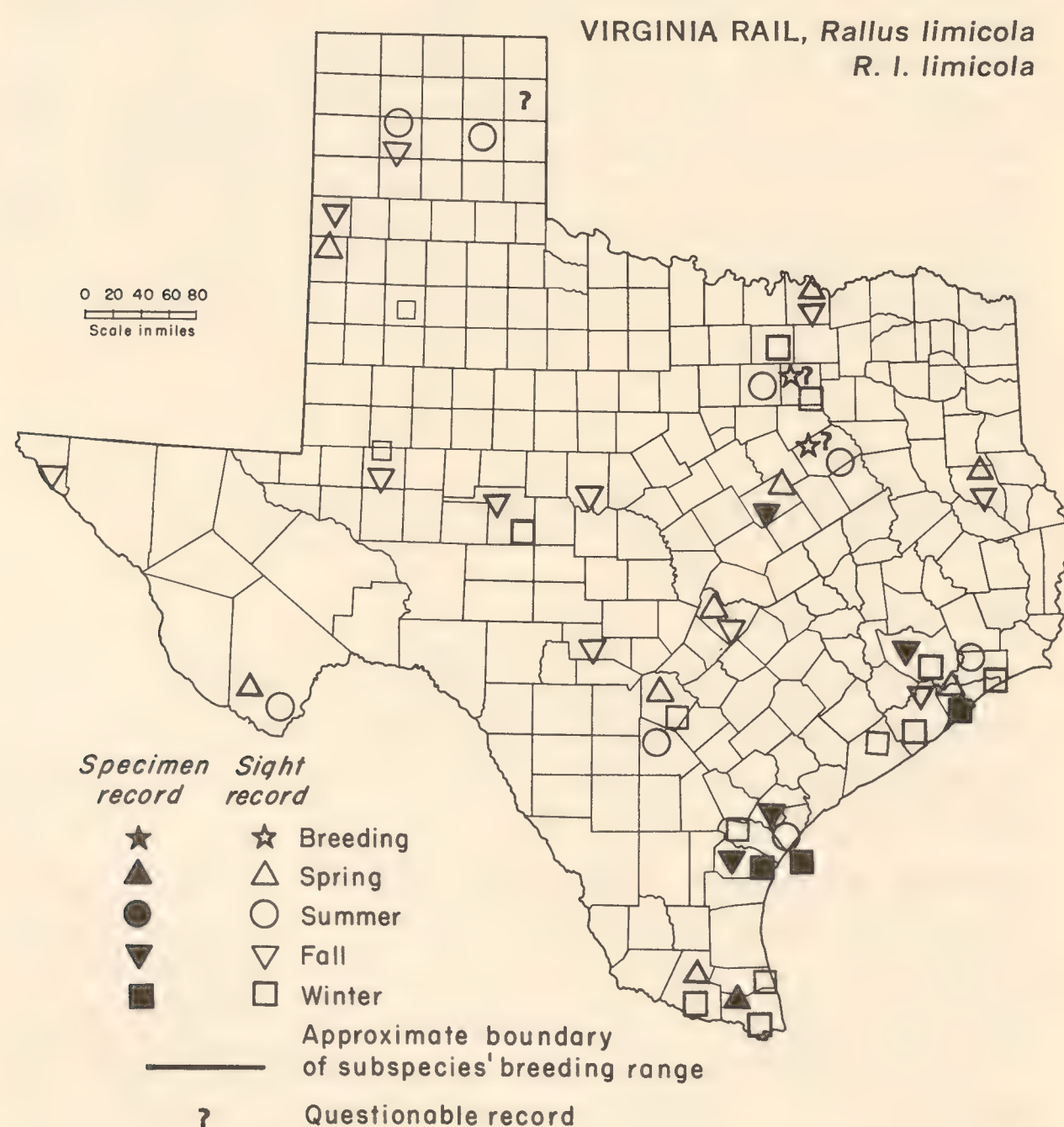
DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts, including tail, fuscous black to fuscous, edged very narrowly on pileum and hindneck, sometimes narrowly on rump, broadly elsewhere, with saccardo umber or light brownish olive; wing-quills fuscous; scapulars and tertials edged with light brownish olive; lesser and most of median wing-coverts russet or between mars brown and russet; supraloral stripe dull buffy white; sides of head dull neutral gray, broad area from lores to ear-coverts deep mouse gray; chin white; throat, jugulum, and breast mikado brown or between cinnamon and fawn color; flanks, sides, and crissum chaetura black to chaetura drab, narrowly barred with white; lining of wing hair brown mottled with white. Culmen black; terminal third of bill seal brown, rest of bill yellowish brown or rufous; mouth and tongue dull white; inside of iris red, orange ochraceous, or reddish brown; anterior part of legs and feet hazel, posterior part chestnut; claws hair brown. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults but darker and more richly colored. *First nuptial:* Acquired by partial prenuptial molt. Identical with nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Practically identical with first nuptial, except for rather darker coloration. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults but duller above with less contrasted light edgings and these more rufescent; lower parts, except middle of breast and abdomen, much marked with fuscous, fuscous black, or chaetura drab, this color almost solid on sides of breast; sides of head chaetura drab. *Natal:* Upper parts black with metallic dark green gloss; lower parts brownish black. Bill scarlet or orange-red, somewhat marked with blackish in front of nostril and on base of mandible.

MEASUREMENTS: *Adult male:* Wing, 100.1–113.0 (average, 105.6) mm.; tail, 39.6–49.0 (44.7); bill (exposed culmen), 36.6–44.4 (41.7); height of bill at base, 8.9–9.9 (9.7); tarsus, 31.5–39.1 (35.3); middle toe without claw, 33.0–39.6 (36.8). *Adult female:* Wing, 94.0–105.4 (101.6); tail, 38.1–48.0 (42.7); bill, 35.1–42.4 (39.9); height of bill, 8.4–9.4 (8.9); tarsus, 31.0–37.6 (34.3); middle toe, 32.0–37.6 (34.3).

RANGE: Locally from c. Saskatchewan to Nova Scotia, south to n. New Mexico, Missouri, and e. Virginia; also Valley of México. Winters locally from c. Colorado, s. Michigan, and s.e. New York to s. Texas and s. Florida, and irregularly through e. Mexico to s. Guatemala.

TEXAS: *Summer:* See detailed account. *Migration:* Collected north to Dallas (exact date unknown), east to Harris, south to Cameron, west to Bexar (ca. 1860) cos. *Winter:* Taken in Galveston (1 specimen), Aransas (1), and Nueces (1) cos.

NESTING: *Nest:* In freshwater marshes or along marshy streams; in tussocks or heaps of muddy reeds or driftwood; platform composed of coarse grasses, stalks of cattails and weeds; lined with small pieces of marsh vegetation. *Eggs:* 5–14, usually 7–10; ovate to elongate ovate; buffy white to buff; rather spar-



ingly spotted with various shades of brown and grayish purple, and with lilac and drab gray shell markings; average size, 32.0 × 24.4 mm.

SORA, *Porzana carolina* (Linnaeus)

SPECIES ACCOUNT

Sora Crane of some authors. A small rail with short chickenlike yellow bill; yellowish green legs. *Adult*: brownish above, spotted and streaked with black and white on mantle; black lores, chin, throat (black reduced on female); grayish breast and belly, with white-barred blackish sides and flanks; tail frequently upturned, revealing cinnamon buff crissum bordered laterally with white. *Immature*: little or no black about face; brownish buff breast; buffy white abdomen and crissum. Length, 8¾ in.; wingspan, 13¾; weight, 2 oz.

RANGE: British Columbia and Mackenzie to s. Quebec, south to n.w. Baja California, New Mexico, Missouri, and Pennsylvania. Winters from c. California, s. Texas, and Florida through Mexico and Central America to Colombia, Peru, Venezuela, Guyana, and Brazil; also West Indies and Trinidad.

TEXAS: (See map.) *Summer*: June 18 to July 18; once as late as Sept. 26. Rare and highly local over state south to 28th parallel. Young located: El Paso Co., Ascarate Lake (July 11, 1958, J. Steward); Dallas Co., near Dallas (July 18, 1959, C. E. Kiblinger, Eula Whitehouse); Galveston Co., Galveston Island (June 26, 1954, fide S. G. Williams); San Patricio Co., Welder Wildlife Refuge (Sept. 26, 1964, Marshall White). Actual records of nests, eggs, or chicks lacking. *Migration*: Early Mar. to mid-May; late Aug. to early Nov. (extremes: Feb., June 6; July 26, Dec.). Common lo-

cally, usually along coast, to uncommon through all parts. *Winter*: Dec. to Feb. Fairly common to uncommon near coast; locally uncommon to rare in most of interior western two-thirds, but absent in northern Panhandle; no records from interior eastern third.

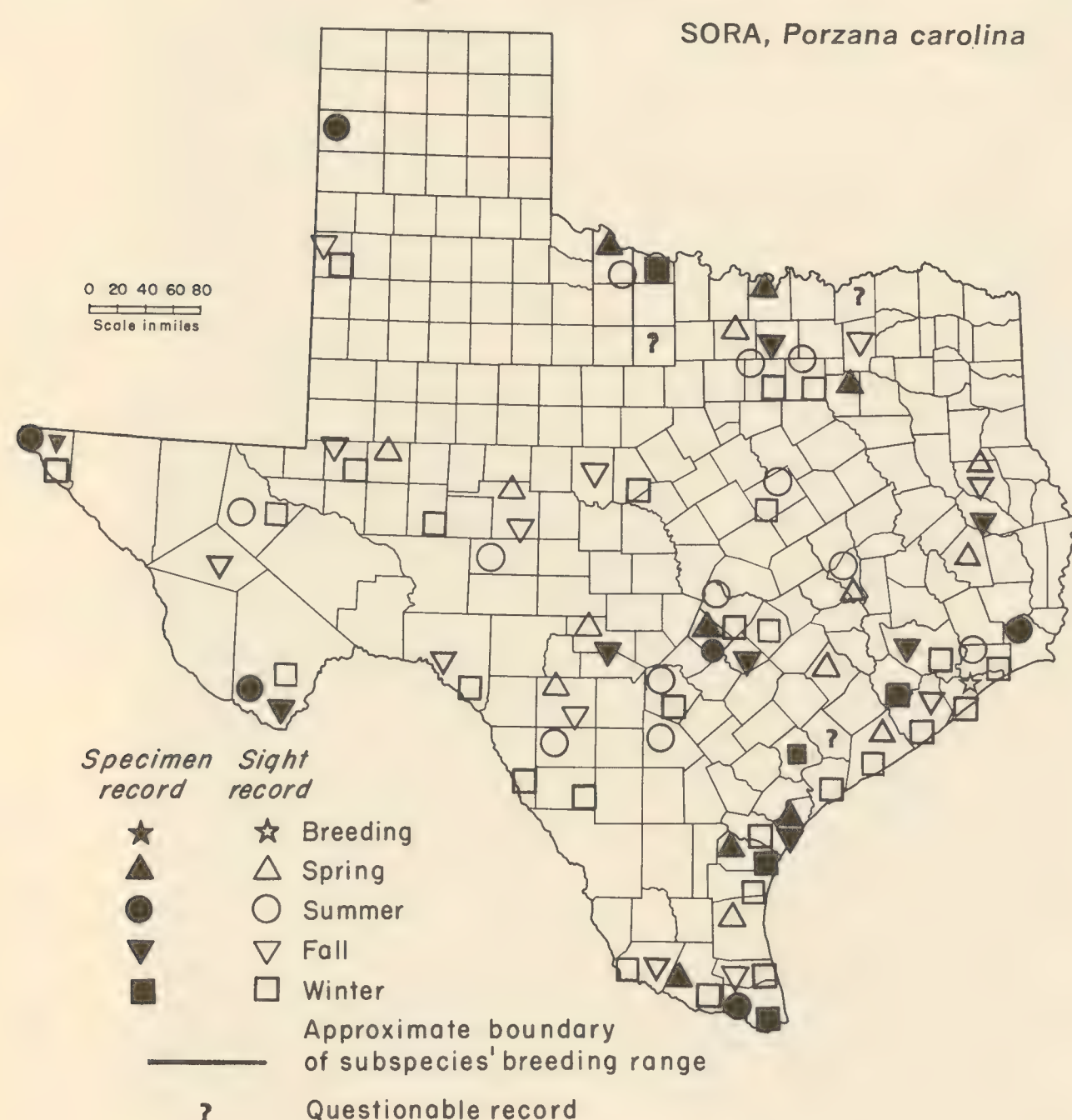
HAUNTS AND HABITS: Most marshes, bogs, and swamps of Canada and the continental United States conceal a Sora or two sometime during the year. This small, short-billed rail breeds chiefly north of Texas in freshwater marshes, sedgy, cattailly, or reedy ponds, beside rivers and sluggish streams, and in similar oozy situations. Wintering places extend from Gulf of Mexico marshes to those of the West Indies and South America. Some individuals thus transit approximately three thousand miles each spring and fall. Usually silent, they fly by night and seclude themselves by day. Although the whole of Texas is on their route, they are seen only rarely and, as is the case with rail watching, not without some effort. In Texas, winter birds occur mostly in fresh or tidal marshes along the coast—rarely inland—where they seek suitable dense coverage. The species is basically nongregarious, but often large numbers simultaneously leave their summer home on the first night of frost; therefore, in some areas of the United States, under favorable conditions, a large autumn wave of Soras will occur.

Observers of a flushing Sora find it difficult to believe that this short-winged, feebly fluttering, hesitant species is capable of overseas travel, but weak wing-beats of a frightened bird are transformed during migration to strong, steady, sustained flight. *Porzana carolina* is a low-flying nocturnal migrant. Consequently, primary hazards on its journey are buildings, utility wires, and other man-made obstacles; over the years, many dead Soras have been found on the streets of Texas cities. Usually at dusk, a Sora—with long strides and bobbing head and tail—moves to marsh edge where it feeds on insects, mollusks, dragonflies, and other tiny animals. In northern states, birds congregate in summer and fall in large open fields of wildrice (*Zizania*); often they share these feeding grounds with Bobolinks.

The standard Sora call is a whinny of twelve to fifteen sweet clear notes, running together on a descending scale until the last six or so notes become slower and monotone. Other calls include a *keek* and *ca-weep-weep*; a rock splashed in the marsh or clapping of hands sometimes provokes these cries. Its plaintive springtime vocalization is a whistled *ker-wee*. Winter birds often call with surprising frequency in Texas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Forehead, lores, chin, and middle of throat black; superciliary stripe, which meets its fellow across forehead, neutral gray; upper parts light brownish olive, central stripe on crown dull black, feathers of back, rump, and upper tail-coverts with broad dull black or chaetura black centers, mantle with white spots or lateral streaks on feathers; tail fuscous black, margined with dull brownish olive; wing-quills between hair brown and fuscous, outer primary edged with white; tertials fuscous black, centrally margined with





Sora, *Porzana carolina*

light brownish olive and slightly edged with white; upper wing-coverts saccardo umber with a few white spots or streaks on outer webs; postocular spot white; broken postocular stripe light brownish olive; sides of head below eye, sides of throat, and jugulum neutral gray; middle of breast and abdomen grayish; sides and flanks chaetura black, broadly barred with white; crissum centrally cinnamon buff, laterally white; lining of wing hair brown mottled with white. Bill lemon yellow, chrome yellow, or citron yellow, but terminal portion, particularly of maxilla, olive yellow, greenish olive, or olive green, also extreme tip dull green, smoke gray, or black; tongue flesh color, but tip smoke gray; inside of mouth flesh color; iris burnt umber, raw umber, or carmine; legs and feet olive, yellowish olive green, olive yellow, or oil green, scales yellow; claws drab or drab gray. *Adult female, nuptial*: Acquired by partial postnuptial molt. Similar to nuptial adult male, but with less black on head and this duller, as is remainder of plumage; mantle also with more white spotting. *Adult male and female, winter*: Acquired by complete postnuptial molt. Similar to corresponding sex of nuptial adults, but black on throat narrower and more or less interrupted. *Male and female, first nuptial*: Acquired by partial prenuptial molt. Similar to corresponding nuptial adult but colors duller. *Male and female, first winter*: Acquired by partial postjuvinal molt. Similar to corresponding sex of first nuptial, but less black on throat and anterior part of head; less gray on anterior lower parts. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adult female, but upper parts more rufescent; crown olivaceous sepia, ground color of back and wing-coverts brownish saccardo umber, wing-coverts with narrow grayish white bars formed by tips of feathers; little or no black on forehead, lores, chin, and upper throat; cheeks brownish white; jugulum dull neutral gray washed with pale buff; sides dull dark hair brown, mixed with color of back; abdomen pale buffy white; crissum pale pinkish buff. Bill yellowish green, but tip brown, or with maxilla dull white and mandible cinereous; iris dark brown; legs and feet green or pale broccoli brown. *Natal*: Upper parts black with greenish metallic sheen, especially posteriorly; under surface with some orange down. Bill yellow with red protuberance at base; legs and feet of female dull green.

MEASUREMENTS: *Adult male*: Wing, 100.1–116.6 (average, 106.9) mm.; tail, 41.9–54.1 (48.0); bill (exposed culmen), 17.0–24.1 (20.1); height of bill at base, 8.4–9.9 (8.9); tarsus, 28.4–36.6 (32.5); middle toe without claw, 31.0–40.4 (35.6). *Adult female*: Wing, 98.6–109.0 (101.6); tail, 38.1–49.0 (43.9); bill, 17.0–22.1 (19.6); height of bill, 7.1–9.4 (8.1); tarsus, 26.9–32.5 (30.5); middle toe, 27.9–36.1 (33.5).

TEXAS: *Summer*: See species account. *Migration*: Collected north to Oldham (June 6), east to Kaufman, Angelina, and Jefferson (Aug. 8), south to Cameron, west to Brewster and El Paso cos. *Winter*: Taken near coast northeast to Fort Bend, southwest to Victoria and Cameron cos.; inland in Wichita Co. (Jan. 18, 1960, W. W. Dalquest; Midwestern University collection, no. 18055).

NESTING: *Nest*: In marshes or meadows, occasionally in grass or grain fields; placed in grass above water and concealed by overhanging grass; poorly constructed cup; composed of grass, weeds, rushes, flags, and other marsh vegetation. *Eggs*: 4–18, usually 10–12; ovate; smooth and glossy; ivory yellow to cinnamon buff or pale olive buff; with large rather widely spaced markings of various shades of reddish brown, and shell markings of drab and ecru drab; average size, 31.5 × 22.6 mm.

YELLOW RAIL, *Coturnicops noveboracensis* (Gmelin)

SPECIES ACCOUNT

A very small rail with short, brown-tipped yellowish bill; grayish or flesh-colored legs; if flushed, reveals conspicuous white wing-patch on secondaries. Largely

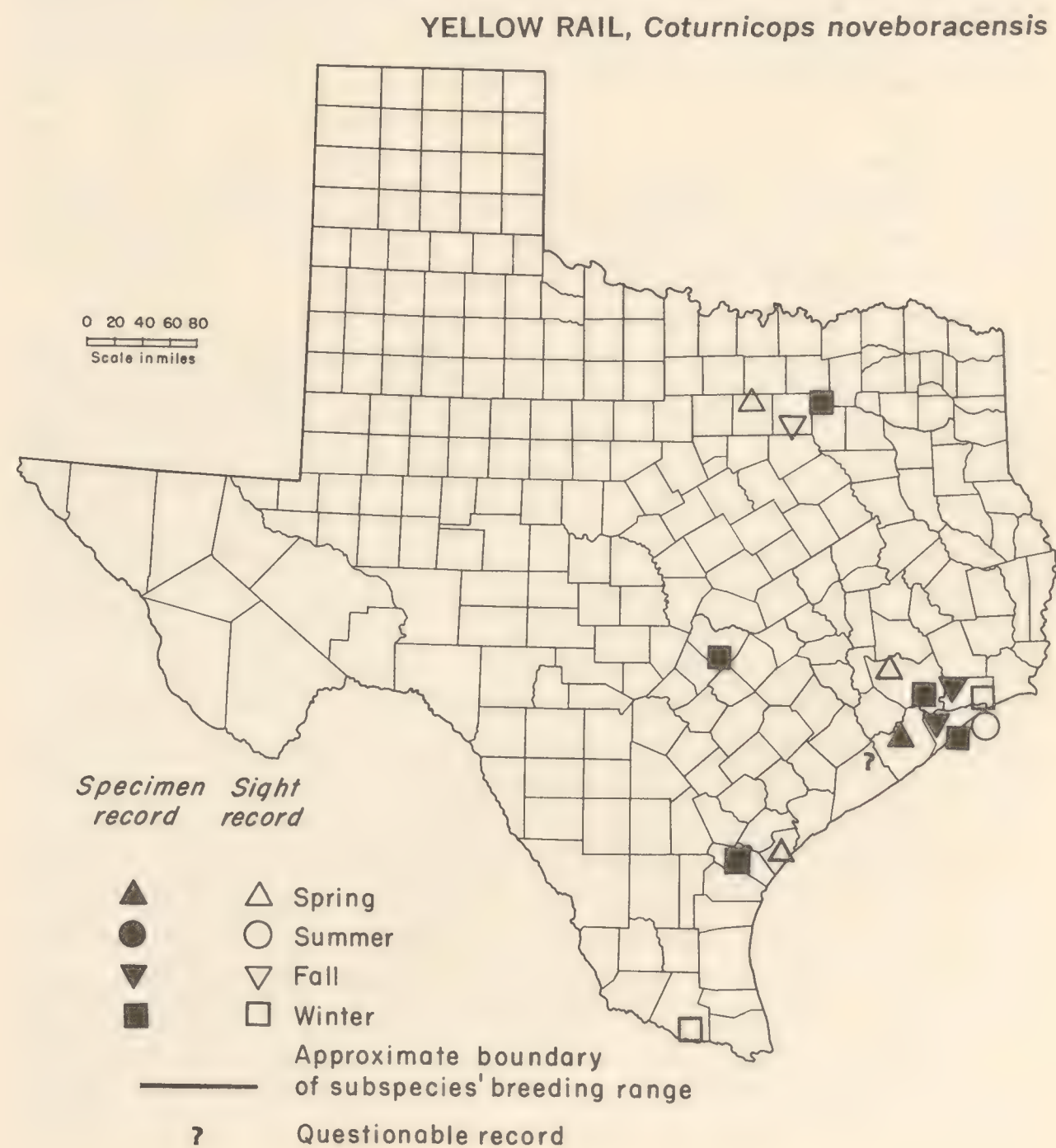
tawny above and below with blackish crown, streaks on back, and barring on sides and flanks; whitish chin, abdomen. Length, 7 in.; wingspan, 12¼; weight, 2½ oz.

RANGE: Locally from s. Mackenzie and n. Manitoba to New Brunswick, south to c. Alberta, Ohio, and Connecticut; c. eastern California; and State of México (valley of Toluca). Winters locally in California, and from Gulf states to South Carolina and Virginia.

TEXAS: (See map.) *Winter*: Early Oct. to early Mar. (extremes: Aug. 30, Apr. 21). Uncommon locally to rare on upper coast; rare to casual in remainder of eastern half.

HAUNTS AND HABITS: In North America, the diminutive Yellow Rail and its even tinier relative, the Black Rail, vie as the most elusive of the skulky Rallidae. This distinction accounts for their being two of the least observed birds in the United States, not to mention that haunts and habits of both are still not fully understood. The present species breeds in shallow freshwater marshes and wet meadows where the grass or sedge is usually less than two feet high, rather than in marshes of tall reeds and cattails. Its nest is a fine-grass cup near water's edge, on a tussock, or blanket of dead vegetation, and usually with a few arching stems of old grass for a concealing canopy. Apparently, birds return early to these places in spring and linger late in fall. The few Yellows that winter in Texas seek out the higher drier portions of Gulf coast marshes. However, at Anahuac National Wildlife Refuge (Chambers Co.), a prime rail haunt, the Yellow seems to occur in all parts of the grassy marsh except where cattails are thick.

Flushing a Yellow Rail without a bird dog or moving vehicle is practically impossible. When and if the bird



takes wing, it flies feebly not much above grass level. It flutters briefly, then drops to cover—legs dangling and wings lifted—where escape is continued on foot through the thick grass. So reluctant is the bird to leave cover that many are cut up by the blades of slowly advancing hay mowers—the rail simply waits too long to flush. Thus, during the American Ornithologists' Union convention in October, 1952, many bird enthusiasts witnessed a creeping machine sever Yellow Rail heads, wings, and legs in a hayfield near Baton Rouge, Louisiana. During migration, which occurs in darkness, flight is necessarily strong and long sustained. Small snails, insects, seeds, and leaves of grass and clover are the only foods recorded for the species.

Clicking notes of the Yellow Rail—usually the first and often the only indication of its presence—are long series uttered in groups of two or three: *tic-tic, tic-tic-tic; tic-tic, tic-tic-tic*, etc. (also rendered as *kuk-kuk*, etc.); another call is seven or eight notes concluding with a rising, drawn-out *queah*. The Yellow Rail in Texas is usually silent, thus adding to the difficulty of locating one of the very most secretive birds in the world.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN YELLOW RAIL, *Coturnicops noveboracensis noveboracensis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (light ochraceous phase):* Acquired probably by partial prenuptial molt. Above dull black or fuscous black; broad superciliary stripe, narrow edgings on crown, and broad edgings on rest of upper parts ochraceous tawny, tawny olive, or clay color; back, rump, and scapulars with very narrow bars of white; also, in unworn plumage, small white spots often present on pileum and cervix; tail dull clove brown or fuscous black, narrowly edged with russet, and with a few small spots of white; wing-quills light hair brown to hair brown; inner secondaries largely white terminally; most of wing-coverts colored, spotted, and barred like back, greater series dark hair brown; chin buffy white or very pale buff; throat, jugulum, and breast clay color to dark ochraceous tawny, often more or less barred with dark brown and sometimes with narrow whitish squamate edgings; abdomen white or buffy white; sides and flanks fuscous, edged with clay color and barred very narrowly with white; lower tail-coverts pecan brown or vinaceous fawn, sometimes with small spots or bars of white; lining of wing white, posteriorly somewhat mixed with light hair brown. Bill greenish black, base dull yellow or orange, tip dark brown; tongue white, gray at tip; iris prout brown, yellowish brown, or reddish brown; legs, feet, and claws light brownish or greenish flesh color, or drab gray. *Adults, nuptial (dark ochraceous phase):* Similar to light ochraceous phase, but upper and anterior lower parts much more deeply colored. *Adults, nuptial (light gray phase):* Similar to light ochraceous phase, but upper parts paler, duller, and much more grayish, edgings of feathers pale clay color or dull chamois, head fuscous or chaetura drab; lower parts pale clay color or dull chamois across jugulum; sides and flanks lighter and more blended. *Adults, nuptial (dark gray phase):* Similar to light gray phase but very much darker both above and below; upper parts dull black or chaetura black with many white spots on sides of neck; sides of head duller and much more grayish than these parts in either light or dark ochraceous phases. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adults but averaging darker and more richly colored. *Second winter:* Acquired by complete postnuptial molt. Identical with adults in corresponding phase. *First nuptial:* Acquired by wear from

first winter, with which it is practically identical. *First winter:* Acquired by partial postjuvenile molt. Similar to nuptial adults in corresponding phase, but hindneck more conspicuously and broadly streaked and less spotted and barred; pileum and hindneck without dots or narrow bars of white. *Juvenal:* Acquired by complete postnatal molt. Similar to first winter but lighter and with less, sometimes very little, narrow white barring and spotting.

MEASUREMENTS: *Adult male:* Wing, 79.0–93.0 (average, 86.6) mm.; tail, 27.4–38.6 (33.3); bill (exposed culmen), 11.9–15.5 (13.7); height of bill at base, 6.1–7.6 (6.9); tarsus, 21.1–27.4 (23.6); middle toe without claw, 20.6–25.9 (23.6). *Adult female:* Wing, 75.4–88.9 (84.3); tail, 28.4–34.5 (32.3); bill, 10.9–15.0 (13.2); height of bill, 5.6–7.1 (6.6); tarsus, 20.1–25.9 (22.9); middle toe, 19.6–24.4 (22.9).

RANGE: Identical to that of species with exception of State of México.

TEXAS: *Winter:* Taken in Rockwall, Harris, Galveston, Chambers (Oct. 30, Nov. 27), Brazoria (Mar. 11), Matagorda (date unknown), San Patricio, and Travis cos.

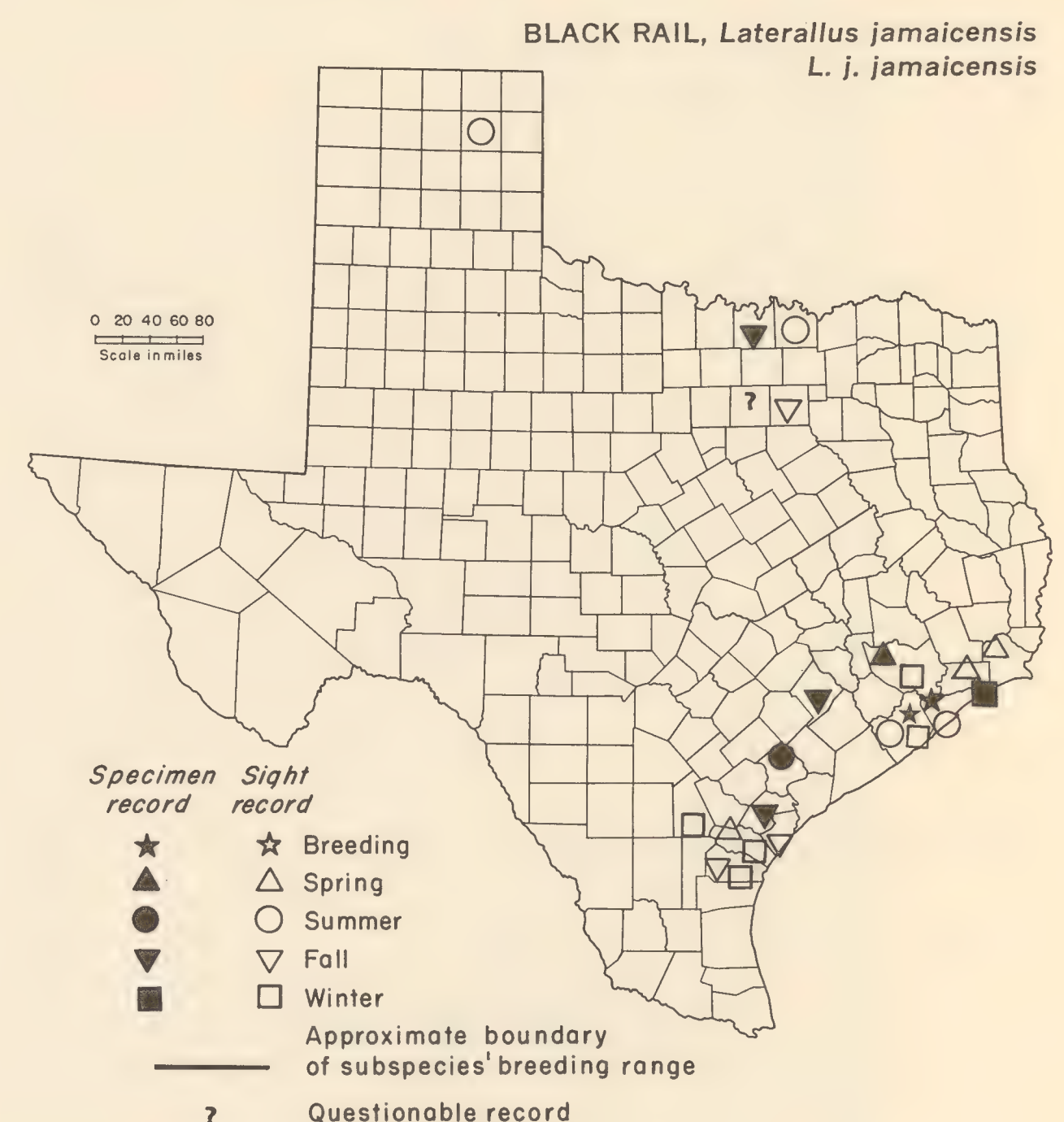
BLACK RAIL, *Laterallus jamaicensis* (Gmelin)

SPECIES ACCOUNT

Black Crake of some authors. A tiny, sparrow-sized rail with small black bill; dark red eyes; blackish (eastern race) legs. White-flecked dark brownish back and wings with rusty nape-patch; slate gray head, neck, breast; finely white-barred blackish flanks and crissum. Length, 6 in.; wingspan, 10¼.

RANGE: S. California to n.w. Baja California; rarely and locally from Kansas, Indiana, and Massachusetts, south to Texas, North and South Carolina, and Florida; British Honduras; coast of Peru; c. Chile. Eastern race winters locally from U.S. Gulf coast and Florida to Guatemala and Greater Antilles.

TEXAS: (See map.) *Breeding:* Two reports: Galveston



Co., Bolivar Peninsula (set of 6 eggs obtained, May 9, 1912, E. F. Pope); Brazoria Co., Brazoria Nat. Wildlife Refuge (10 nests containing eggs, several eggs collected, June 5, 1969, R. J. Fleetwood, S. A. Nesbitt). Adults present during breeding season: Roberts Co. (June, 1935, H. F. Saunders); Galveston Co., south of La Marque between Highland Bayou and Galveston causeway (1 on July 26, 1959, Mabel and J. R. Deshayes, V. L. Emanuel); Brazoria Co., Brazoria Refuge (at least 1 from June 4 to Aug. 20, 1970, Fleetwood). *Migration*: Mar. 25 to May 9; Aug. 4 to Oct. 23. Scarce and local on upper coast; rare and local along central coast; casual through interior. *Winter*: Nov. 11 to Feb. 23. Rare and local on and near upper and central coasts.

HAUNTS AND HABITS: Considering the Black Rail's dark plumage, tiny size, and extreme furtiveness, it is not surprising that much remains to be learned of its life history. Prime habitat appears to be saltgrass (*Spartina*) marshes which are touched only by the highest tides. The Black in some localities inhabits also dry oat fields, which is somewhat unorthodox for a member of the usually wet-marsh-oriented Rallidae. The species in Texas is known chiefly as a rare elusive migrant and winter visitor, but since the late 1960's, fair numbers of this and other Texas rails have been glimpsed in cool months by very energetic bird watchers on the new Anahuac and Brazoria national wildlife refuges in the coastal marsh portions of Chambers and Brazoria counties. Sightings of Black Rails should be made with extreme care—chicks of all U.S. rail species are tiny and black.

Even more than most rails, the Black is renowned for its reluctance to flush; when forced to do so, it flies only briefly and clumsily before it falls again to cover. Safety is preferably attained on foot. It is usually during such retreats that this mouse-sized, bobtail, rail-thin bird is glimpsed. Isopods—small crustaceans that eat decaying plant matter—are the only recorded food, but birds probably feed on small insects also.

Vocalizing is generally restricted to the breeding season when females sound a cuckoolike *croo-croo-croo-o*, usually answered by the male's *kik, kik, kik*, etc. (this is even more metallic than similar calls of other rails). Often late at night, a *kickee-doo* (also described as *did-ee-dunk*) is uttered.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN BLACK RAIL, *Laterallus jamaicensis jamaicensis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Top and sides of head dark mouse gray; hindneck auburn; back between clove brown and fuscous; wings similar but paler, both back and wings with small dots of white; tail fuscous black with a few small spots of white; wing-quills light fuscous with a few scattered spots or irregular bars of white; wing-coverts like back; lower parts from throat to abdomen deep mouse gray, chin slightly paler; sides, flanks, and crissum chaetura drab, very narrowly barred with white; lining of wing dark hair brown, spotted or imperfectly barred with white. Bill black; iris dark red; legs and feet fuscous, clove

brown, or brownish black. *Adults, winter:* Acquired by complete postnuptial molt. Practically identical with nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to first nuptial. *Juvenal:* Acquired by complete postnatal molt. Similar to adults but duller and paler; pileum dull black or chaetura black; hindneck sepia or saccardo umber; remainder of upper surface chaetura drab or chaetura black, spotted with white; chin white; remainder of lower surface between light neutral gray and mouse gray, centrally paler with sides chaetura drab or chaetura black and with narrow spots and bars of white. *Natal:* Bluish black. Bill bright yellow, but tip of maxilla and band on middle of mandible black; bill sometimes nearly all black; iris red; legs and feet yellowish green; claws dull brown.

MEASUREMENTS: *Adult male:* Wing, 70.1–75.4 (average, 72.4) mm.; tail, 28.9–34.5 (32.3); bill (exposed culmen), 11.9–15.0 (14.0); height of bill at base, 5.3–6.1 (5.8); tarsus, 21.1–23.1 (22.4); middle toe without claw, 21.1–22.1 (21.4). *Adult female:* Wing, (73.4); tail, 29.9–33.0 (32.0); bill, 13.5–14.0 (13.7); height of bill, 5.3–6.6 (5.8); tarsus, 20.1–23.9 (22.6); middle toe, 21.1–22.1 (21.6).

RANGE: Rarely and locally from s.w. Kansas and Indiana to Massachusetts, south to s.e. Texas, North and South Carolina, and e. Florida. Winters locally from Texas, s. Louisiana, s. Georgia, and Florida to Guatemala and Greater Antilles.

TEXAS: *Breeding:* See species account. *Migration:* Four specimens: Cooke Co., Gainesville (Sept. 11, 1889, G. H. Ragsdale); Harris Co., Spring Creek (Apr. 29, 1879, O. Henning); Colorado Co., Eagle Lake (male, Oct. 12, 1942, H. P. Kirby and W. A. Mayer; Dallas Museum of Natural History, no. 1862); Victoria Co., Goff Bayou (Aug. 4, 1938, Mrs. E. G. Gray). *Winter:* Two specimens: Chambers Co., Anahuac Nat. Wildlife Refuge (male, killed by marsh buggy, "winter," exact date unknown; Texas A&M University collection, no. 8895); Refugio Co., Woodsboro (adult female, Nov. 11, 1966, G. W. Blacklock, Mrs. C. Cottam, Mrs. C. Tomas; Welder Wildlife Refuge collection, no. 1266).

NESTING: *Nest:* In grassy meadows, green fields, or marshes; on the ground or on mat of old grass; a well-cupped, compact depression, usually very well concealed; composed of fine grasses, rushes, and stalks of marsh vegetation; lined with finer pieces of same materials, sometimes also a few feathers. *Eggs:* 6–13, usually 6–10; ovate; white, pinkish white, or buffy white; thickly dotted with reddish brown, lilac, and pale drab, most numerous about larger end; average size, 25.7 × 19.8 mm.

[PAINT-BILLED CRAKE, *Neocrex erythrops* (Sclater)]

A small, short-billed rail. Olive brown head, back, and wings; blue-gray forehead, sides of head, breast, and upper abdomen; dusky blue-gray lores and feathers under eye; obscure buffy loreal streak; white chin; dusky brown lower abdomen, narrowly lined with white; white-barred blackish lower flanks and crissum; olive green bill, bright red basally; red eyes; coral legs and feet. Bill of immature greenish without red on basal portion. Length, 7½–8½ in.; weight, ca. 2¼ oz.

RANGE: Colombia and Venezuela, south to w. Ecuador, w. Peru, Brazil, Paraguay, and Argentina.

TEXAS: *Hypothetical:* One specimen: Brazos Co., 1 mi. south of College Station (male, Feb. 17, 1972, trapped by Don Baker; skin preserved in Texas A&M University collection). Various members of the Rallidae are famous for their unpredictable overseas flights. In the past, even extremely remote islands—

Wake, Laysan, Tahiti, Inaccessible, et al.—have been colonized by apparently feeble-winged rails, which then settled down and became flightless. In the nineteenth and twentieth centuries, man and his rats have exterminated many of the flightless species. Since 1950, importation of continental rails as captives has risen steeply; nowadays most zoos exhibit various forms of these “cute,” “amusing” birds. It is remotely possible that the Texas Paint-billed Crake got here on its own two wings, but the probability that this individual was an escapee is too high to warrant its being placed in good standing on the list of wild Texas birds.]

PURPLE GALLINULE, *Porphyryla martinica* (Linnaeus)

SPECIES ACCOUNT

An exotically colored, hen-sized marsh bird with yellow-tipped red bill; pale blue frontal shield; bright yellow legs. *Adult*: bronzy green back; bluish violet on head, neck, and most of under parts; entirely white undertail. *Immature*: largely greenish brown above; buffy below with white crissum; dull brownish bill, frontal shield. Length, 13 in.; wingspan, 22½; weight (female), 7½ oz.

RANGE: In freshwater marshes from s. Texas to Tennessee, South Carolina, and Florida, south through lowland Mexico (from Nayarit on Pacific) and Central America to n. Argentina; also West Indies (locally), Trinidad, and Tobago. Winters from w. Mexico, s. Texas (a few), and Florida southward through breeding range.

TEXAS: (See map.) *Breeding*: Early Apr. to Sept. (eggs, Apr. 9 to Aug. 12; young barely able to fly as

late as Sept.) from near sea level to 750 ft. Common locally (some years) to uncommon near coast; locally uncommon to rare in remainder of eastern half. *Migration*: Mid-Apr. to late May; early Aug. to late Oct. (extremes: Mar. 5, June 24; July, Dec. 1). Fairly common near coast; uncommon to scarce through remainder of eastern half; increasingly rare west of 99th meridian to Panhandle, El Paso, and Big Bend, where casual. *Winter*: Dec. 26 to Feb. 22. Casual near coast.

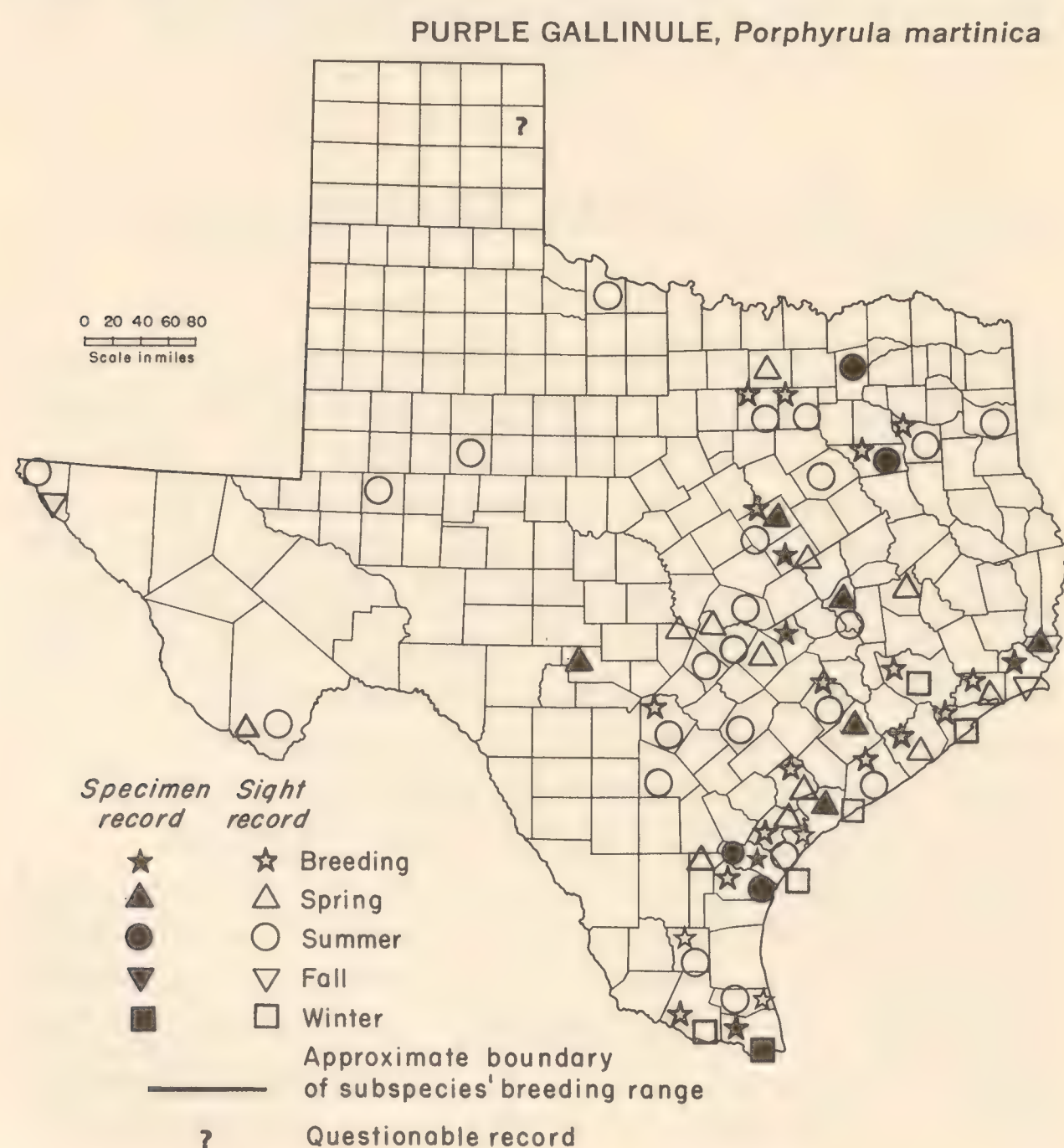
HAUNTS AND HABITS: The Purple Gallinule is surely the most elegant and colorful of North American marsh birds. U.S. individuals nest throughout the Gulf states where they find freshwater ponds and lakes supporting cattails (*Typha*), lotus (*Nelumbo lutea*), waterlilies (*Nymphaea*), waterlettuce (*Pistia stratiotes*), waterhyacinth (*Eichornia crassipes*), reeds, or similar aquatic plants. It is often joined in these haunts by its close relatives, the Common Gallinule and American Coot; the latter, however, breeds more enthusiastically north of the warm ponds frequented by the present species.

Though it flushes more readily than many other rails, its flight is just as feeble and brief; barely does it clear the vegetation before it drops—bright yellow legs dangling—to cover. The Purple Gallinule forages in a variety of situations. Not quite so reclusive as are many rails, it sometimes swims in open water and even feeds in roadside ditches, here walking dovelike with nodding head. With ease, it alights on low tree branches or climbs upon stems and limbs of other plants, often over water, where it feeds on seed heads. Long toes enable it to walk gracefully on floating plants. In and about the marsh, it eats mainly seeds of aquatic plants, also aquatic beetles and bugs. Formerly this gallinule fed much in rice fields in the fall.

Noisy at most times of the year, especially in the breeding season, the Purple Gallinule utters—usually when flying—various henlike cackles and squawks. One frequently sounded call is described as a shrill laughing *hiddy-hiddy-hiddy, hit-up, hit-up, hit-up*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head dusky violet blue or dark aniline blue; hindneck, sides of neck, and anterior portion of sides of body glossy motmot or capri blue; middle of lower hindneck, back, and scapulars olive green; rump, upper tail-coverts, and tail dark greenish olive, inner webs of all but outer rectrices fuscous; wing-quills fuscous, lesser wing-coverts beryl or methyl green, rest of upper wing-coverts dull terre verte, with edges of deep dull yellowish green; edges of primaries dull greenish olive to porcelain green; most of lower parts dull bluish violet, but chin somewhat blackish, abdomen blackish brown, and lower tail-coverts white; lining of wing posteriorly dull hair brown, otherwise green like back and mixed with motmot blue and dark bluish violet, all of these blue and green colors more or less glossy. Bill vermilion or dark red, broadly tipped with greenish citron yellow or apple green; frontal shield anteriorly red, posteriorly flax flower blue or dull brownish blue; iris crimson, garnet brown, or hazel; legs and feet greenish yellow, chrome yellow, or canary yellow; claws maize yellow. *Adults, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adults. *First nuptial*: Acquired by wear from



first winter. Similar to nuptial adults, but with usually a few brown feathers on neck and head and white feathers on throat. *First winter*: Acquired by nearly complete postjuvenile molt. Similar to first nuptial, but feathers of breast with whitish tips; plumage otherwise rather duller. *Juvenal*: Acquired by complete postnatal molt. Pileum and hindneck between olive brown and deep olive; back and scapulars yellowish olive, verging toward brownish olive on latter; rump mummy brown; upper tail-coverts prout brown, both with very narrow terminal or sub-terminal blackish bars; tail dark olive brown; wing-quills hair brown to dark hair brown; anterior lesser wing-coverts pistachio green, outer edge of wing terre verte; greater and median coverts jade green on outer webs; many of lesser coverts, particularly posteriorly, edged with dull pale buff or buffy white; lining of wing light terre verte or gobelin blue, posteriorly hair brown; sides of head and of throat tawny olive; chin and upper throat buffy white; breast dull pinkish buff, washed with dull green on sides, and with obscure light fuscous tips which give a somewhat scalelike appearance; sides dull cinnamon buff with same markings; crissum white; middle of abdomen buffy white. Bill dull yellow; frontal shield dull brown. *Natal*: Upper parts black with metallic dusky olive green gloss, particularly on posterior portion; anterior lower parts dull black; chin and upper throat with a few white hairlike feathers; posterior lower parts fuscous black. Base of bill dull red, terminally black with band of light dull blue; iris brown; legs and feet dull orange brown.

MEASUREMENTS: *Adult male*: Wing, 169.9–186.2 (average, 177.8) mm.; tail, 68.1–77.0 (71.7); bill (exposed culmen), 25.7–32.0 (30.7); height of bill at base, 14.0–16.0 (15.2); tarsus, 62.0–68.1 (65.3); middle toe without claw, 56.9–65.0 (61.2). *Adult female*: Wing, 167.9–176.0 (172.2); tail, 66.0–78.0 (70.9); bill, 26.9–29.9 (28.7); height of bill, 14.0–15.0 (14.5); tarsus, 54.6–65.0 (61.0); middle toe, 54.1–61.0 (58.2).

TEXAS: *Breeding*: Collected north to Hunt, east to Orange, south to Cameron cos. *Migration*: One specimen outside breeding range: Kerr Co. (May 30, 1909, H. Lacey). *Winter*: One specimen: Cameron Co., Brownsville (Feb. 22, 1910, F. B. Armstrong).

NESTING: *Nest*: In swamps and marshes, or along water-courses; usually in tall grass, cattails, rushes, or other marsh vegetation; shallow platform woven into adjacent vegetation; composed of leaves and stems of rushes, grasses, flags, and other marsh vegetation, with sometimes pieces of morningglory vines and other plants; lined with finer similar materials. *Eggs*: 5–10, usually 6–8; ovate to elliptical ovate; dull white, pale buff, or pale cinnamon pink; with a few spots of dark brown and different shades of drab about larger end; average size, 39.4 × 28.7 mm.

COMMON GALLINULE, *Gallinula chloropus* (Linnaeus)

SPECIES ACCOUNT

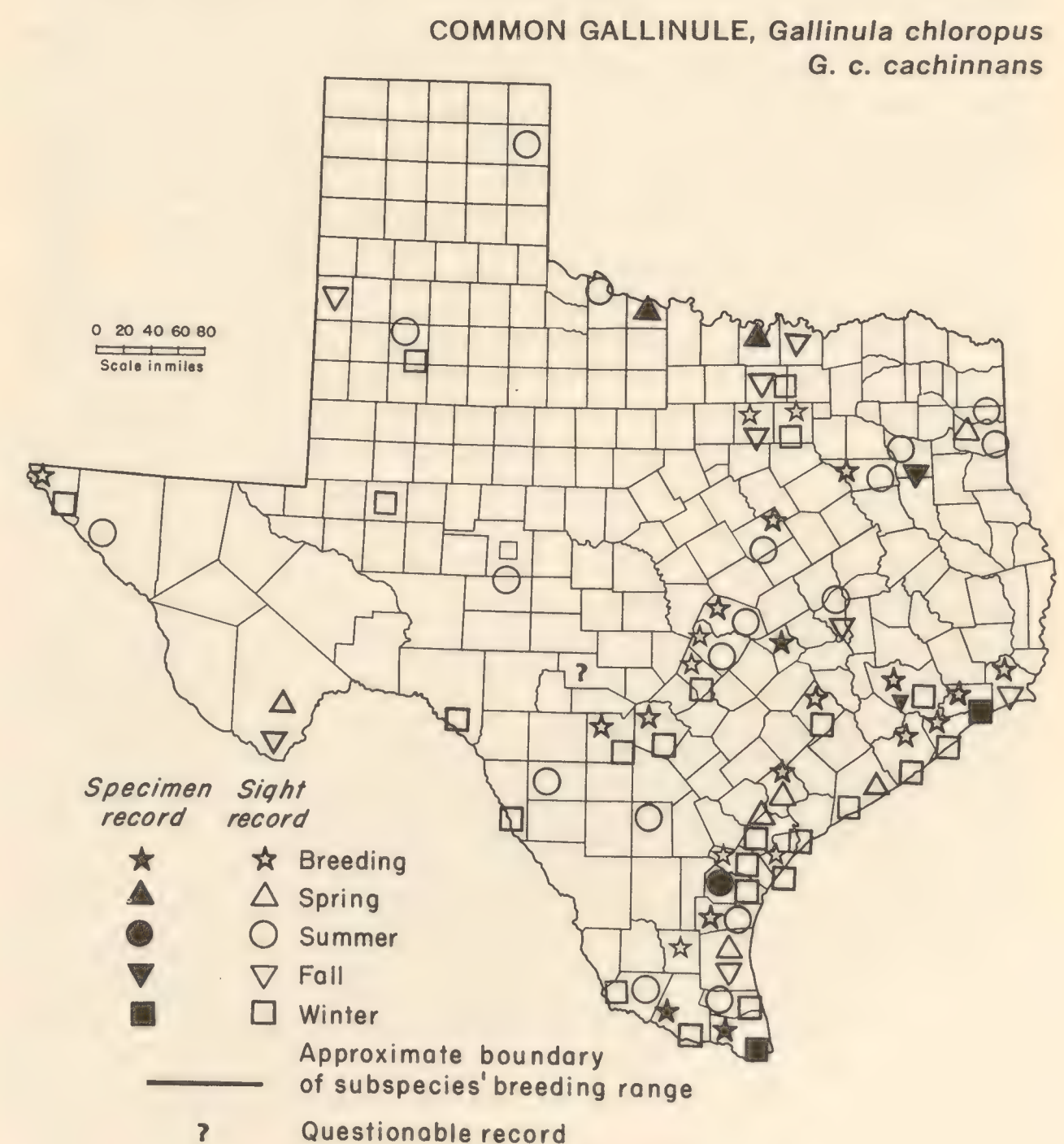
Moorhen of British authors. A marsh bird similar in size and shape to the more colorful Purple Gallinule; has red (not pale blue) frontal shield; yellow-tipped red bill; yellowish green legs. *Adult*: dark brown above with slate gray head and neck; lighter slate gray below with horizontal white stripe on side; broadly white-bordered, centrally black crissum. *Immature*: paler and browner with vague side-stripe; rudimentary frontal shield; grayish brown bill. Length, 14 in.; wing-span, 22½; weight (male), 13 oz.

RANGE: Widely in Eurasia, Africa, East Indies, Hawaiian Islands, North and South America. Migratory in cold portions of range.

TEXAS: (See map.) *Breeding*: Early Apr. to late Sept. (eggs, Apr. 15 to July 25; downy young as late as Sept. 9) from near sea level to 3,700 ft. Common to fairly common near coast; locally fairly common (some years) to scarce in remainder of eastern two-thirds; uncommon in El Paso region. Has summered at Lubbock. *Winter*: Nov. to Mar. Fairly common (some years) to uncommon near coast and inland at Dallas; scarce to rare in remainder of interior, north to Lubbock and Denton.

HAUNTS AND HABITS: The Common Gallinule, found on all continents but Australia and Antarctica, is the most cosmopolitan species of its family. It seeks fresh shallow marshes, large or small, or the edges of lakes where reeds, cattails, and other aquatic plants abound. In warmer parts of the Americas, it shares many of these places with its more vivid relative, the Purple Gallinule. However, the Common is a bit less specialized in its breeding habitat requirements: Apparently it can get along without the floating vegetation—lily and lotus pads, etc.—used by the Purple. Not particularly shy, Common Gallinules even dwell in less polluted marshes near human habitation. Northern-breeding birds in the United States move south in the cool months; swamps and marshes near the Gulf coast and resacas along the Rio Grande are chief winter haunts in Texas. This gallinule, not as gregarious as is the American Coot, occurs, at most, only in small loose parties.

On migration, it is a powerful, direct, and fairly swift flier. However, flight when flushed, like that of most rails, is heavy and awkward. The bird seems loath to fly farther than a short distance and at first opportunity drops back again to cover. Lifting from water, the gallinule first skitters along the surface before it gets



fully on the wing. More of a water than a land bird, the Common Gallinule is a good swimmer even though its toes are neither lobed nor webbed. Breast sinks low and hind parts ride high as it bobs along coot fashion. Afloat, it feeds by picking food off the water's surface or from lily pads; sometimes it dives and tips up like a duck. Wading or on land, it searches for food as it jerks along, nods its head, and twitches its tail. This gallinule eats chiefly seeds and other parts of aquatic plants, such as duckweed (*Lemna*). It also takes snails, worms, and insects.

The Common Gallinule's extensive vocabulary includes croaking *kr-r-ruk's*, froglike *kup's*, a *kek, kek, kek*, and other henlike squawks and clucks. During territorial-courtship display, the male utters a harsh *ticket-ticket-ticket-ticket* series.

DETAILED ACCOUNT: ONE SUBSPECIES

FLORIDA COMMON GALLINULE, *Gallinula chloropus cassinians* Bangs

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum blackish mouse gray; nape deep neutral gray; back, rump, and scapulars dark olive brown or dark bister; upper tail-coverts and base of tail clove brown; tip of tail fuscous black; wing-quills light olive brown to fuscous; upper wing-coverts deep mouse gray, washed with grayish olive; outer scapulars deep grayish olive; outermost primary narrowly margined with white; chin, throat, sides of head and of neck dark mouse gray or chaetura black; breast and sides deep neutral gray, sides broadly streaked with white; middle of abdomen neutral gray; crissum white, middle feathers black; lining of wing dark hair brown mixed with white. Bill bright vermilion, crimson red, poppy red, or scarlet, terminal part greenish yellow, sulphur yellow, or apple green, frontal shield cadmium orange or scarlet; iris brussels brown or red; anterior face of tarsus javel green, apple green, or citron yellow; posterior part of tarsus lettuce green, calla green, apple green, or oil green; upper surface of toes apple green, oil green, lettuce green, or calla green, joints sage green or pale russian blue; soles of toes pale russian blue; claws slate black or ecru drab with black tips; bare lower fourth of tibia with ring of flame scarlet passing to dull crimson and cadmium orange to yellow, then to apple green, and then to sage green or russian blue of tarsal joint, thus forming broad, conspicuous red-to-yellow band. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but bare frontal shield smaller; feathers of posterior lower parts broadly edged and tipped with white. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but frontal shield only a little developed; throat with more or less white. *First winter:* Acquired by nearly complete postjuvenile molt. Similar to first nuptial. *Juvenal:* Acquired by complete postnatal molt. Much duller than adults; frontal shield rudimentary; pileum fuscous; hindneck dark hair brown; back between olive brown and bister; rump clove brown; sides of head and of throat mouse gray finely mottled with white; lores and cheeks deep mouse gray; chin and upper throat dull white, latter somewhat mottled with deep mouse gray; jugulum and breast grayish hair brown; sides and flanks dark hair brown to fuscous; middle of lower breast and abdomen white. Bill dull brown; frontal shield rudimentary; basal half of maxilla reddish brown, terminal half olive green; basal half of mandible brownish olive, terminal half olive green; frontal shield brownish olive; iris dark brown; legs and feet olive green, joints sage green; band on bare lower portion of tibia dull orange above shading to olive yellow below. *Natal:* Above black with metallic dusky olive green gloss; anterior lower parts black, chin and upper throat with a few white hairlike feathers; posterior lower parts fuscous to fuscous black. Bill yellowish or reddish with

narrow dark brown band at middle; skin at base of bill bright red.

MEASUREMENTS: *Adult male:* Wing, 170.9–184.9 (average, 175.8) mm.; tail, 70.1–81.0 (73.7); bill (exposed culmen), 27.9–32.0 (30.2); height of bill at base, 11.9–13.5 (12.7); tarsus, 55.1–62.0 (57.2); middle toe without claw, 65.0–69.6 (66.8). *Adult female:* Wing, 158.0–175.0 (168.1); tail, 64.0–69.6 (67.1); bill, 26.9–31.0 (29.2); height of bill, 11.4–13.0 (12.2); tarsus, 51.1–56.9 (53.3); middle toe, 57.9–65.0 (61.2).

RANGE: Locally from c. California and c. Arizona, south through Baja California and w. mainland Mexico to Panama and Galápagos Islands, and from Nebraska and c. Minnesota to s. Quebec, south to s. Texas and s. Florida. Winters from c. California and s. Arizona, and from South Carolina, Florida, and s. Texas through Mexico to Panama; also West Indies.

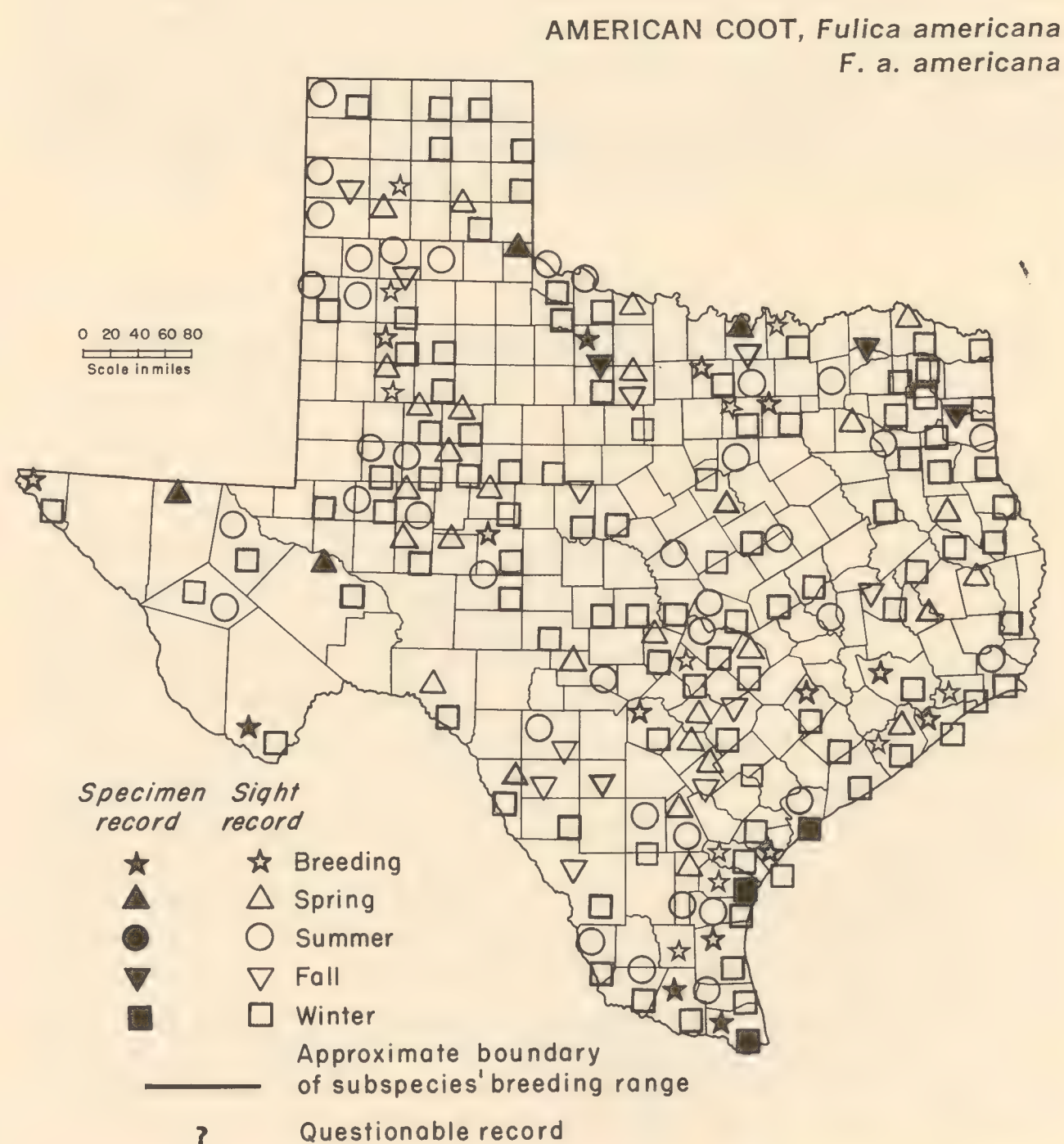
TEXAS: *Breeding:* Collected north to Wichita (nesting likely), east to Harris (Sept. 12), southwest to Cameron and Hidalgo cos. *Winter:* Taken near coast northeast to Chambers, southwest to Cameron cos.

NESTING: *Nest:* In marshes or edges of swamps; a few feet above water or resting on ground in water, often floating on water but anchored to stalks of adjacent vegetation, sometimes in vines; rude platform or heap of reeds, flags, grass, rushes, with stems and leaves of other water plants; lined with dry grass or other vegetation. *Eggs:* 6–17, usually 10–12; ovate; smooth, not glossy; cream buff, cinnamon buff, or pale olive buff; spotted with dark brown, wood brown, and drab; average size, 43.9 × 31.0 mm.

AMERICAN COOT, *Fulica americana* Gmelin

SPECIES ACCOUNT

A chunky ducklike bird but distinguished by small head; conical, milk white bill; and lobed (not webbed) toes. In flight, reveals broadly white-tipped secondaries. *Adult:* slate gray above with blackish head and neck; slightly lighter gray below with white patch on each side of undertail. *Immature:* paler gray; light



grayish bill. Length, 15¾ in.; wingspan, 26¼; weight, 1¼ lbs.

RANGE: British Columbia to New Brunswick, south through United States, Mexico, and Central America (locally) to Andes in Colombia and n. Ecuador; also main Hawaiian Islands (excluding Lanai), Bahamas, and Greater Antilles.

TEXAS: (See map.) *Breeding:* Early Apr. to mid-Sept. (eggs, May 1 to July 21; young of various ages, May 18 to Sept. 3) from near sea level to 4,700 ft. Irregular and quite local; has bred in nearly all parts; normally fairly common to scarce over most of state. *Winter:* Early Sept. to late May. Abundant (especially along coast) to uncommon throughout. Most numerous from Oct. to Dec. and from Mar. to mid-May.

HAUNTS AND HABITS: With lobed toes adapted for swimming, the American Coot is the most aquatic U.S. member of the Rallidae. It is also the most conspicuous and abundant. In cool climes, it nests wherever it finds muddy, reedy, grassy margins of pools, lakes, sloughs, rivers, and creeks—an attraction which has given it the name “mud hen.” In Texas, practically any body of water—fresh, brackish, or salt—suits migrants as well as wintering birds (if south of the hard-frost line); especially during nonbreeding seasons, they mingle freely with ducks and gallinules. In fall, the Texas coot population increases considerably as northern individuals join those birds which have been in the state through the warm months. At this time, large flocks are observed, particularly on lakes, where they often gather in close-knit rafts.

Coot takeoff from the water is prolonged; rising with some difficulty, it patters along the surface, causing great commotion before it is successfully airborne. Well on the wing, flight is strong and, except when migrating, low to the ground or water. Neck and legs extend, but toes point downward, apparently sufficing as a rudder for this virtually tailless bird. In the water, the coot sits high and swims speedily, all the time bobbing its head. It dives like a grebe when feeding or fleeing danger; a frightened individual will cling with its bill to underwater vegetation, sometimes until it drowns. A foraging bird also tips up dabbling duck style in shallow water. Aquatic food includes pondweed (*Potamogeton*), water milfoil or parrotfeather (*Myriophyllum*), burreed (*Sparganium*), other similar plants, and quantities of algae, such as muskgrass. This rather hunch-backed bird walks actively on land, where at times it grazes on grass and sprouting or waste grain.

Coot vocalizations include a vast assortment of croaks, squawks, grunts, cackles, and other raucous notes, whistles, and toots.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN AMERICAN COOT, *Fulica americana americana* Gmelin

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt and wear from winter plumage. Upper half of head blackish mouse gray or blackish neutral gray; mantle,

including wing-coverts and scapulars, light slate color; posterior upper parts between dark mouse gray and dark olive gray; tail chaetura black; wing-quills dark hair brown, tips of secondaries broadly white forming wing-bar; chin, throat, cheeks, and sides of neck fuscous black; remainder of lower parts dull brownish neutral gray, but sides and flanks deep mouse gray; middle of abdomen neutral gray; edge of bend of wing white; middle lower tail-coverts black, lateral coverts white; lining of wing deep mouse gray, feathers mixed or tipped with white. Bill milky white, terminally somewhat bluish or greenish, maxilla and mandible each with dark brown spot near tip, bordered anteriorly by bar of claret brown or reddish chestnut; frontal shield dark chestnut, claret brown, or olive brown; base of culmen tinged with greenish yellow; tongue and inside of mouth white; iris bright crimson or poppy red; legs oil green or bright yellowish green; toes plumbeous or light bluish gray, tinged with yellowish green or oil green on some of scales, with black on joints, edges of lobes, and soles; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but frontal shield smaller and abdomen much mixed with white. *First nuptial:* Acquired by wear from first winter. Like nuptial adults, except for worn wings and tail retained from juvenal and greater amount of white on under parts. *First winter:* Acquired by partial postjuvenal molt. Similar to first nuptial. *Juvenal:* Acquired by complete postnatal molt. Pileum near deep mouse gray; lower hindneck and back between chaetura drab and dark grayish olive; rump chaetura drab; lower parts brownish light neutral gray; sides and flanks mouse gray; chin and center of throat grayish or buffy white; middle of breast and of abdomen sometimes mixed with white. Bill dull flesh color, tinged with olive and lacking spots of adult; frontal shield dull green; iris dark brown. *Natal:* Upper parts black; forehead and lores flame scarlet; sides of head and occiput orange chrome; back with numerous hairlike feathers of light cadmium and pale buff; chin orange chrome; remainder of lower parts deep to dark mouse gray, abdomen somewhat mixed with pale brownish gray, throat with numerous light cadmium hairlike feathers, sides with a few of pale buff or dull white. Bill orange vermilion, pale salmon to pink toward forehead, buff, or dull chinese orange, sometimes ecru drab or olive gray at tip, nail dull black; iris broccoli brown or sepia; legs and feet isabella color, yellowish olive, or broccoli brown, soles of toes and joints drab; claws dark drab, slate black, or brownish black.

MEASUREMENTS: *Adult male:* Wing, 174.0–201.9 (average, 190.2) mm.; tail, 44.4–55.9 (51.3); bill (exposed culmen), 33.0–35.1 (34.3); height of bill at base, 15.0–16.0 (15.7); tarsus, 51.1–62.0 (55.9); middle toe without claw, 66.5–81.0 (73.2). *Adult female:* Wing, 170.9–192.0 (179.3); tail, 40.9–55.1 (49.0); bill, 29.9–34.0 (31.8); height of bill, 14.0–16.0 (15.0); tarsus, 43.9–58.4 (53.1); middle toe, 63.0–74.9 (64.3).

RANGE: C. British Columbia to c. Manitoba and New Brunswick, south to California, Texas, Ohio, and New Jersey, locally in s.e. United States, thence through Baja California and mainland Mexico to Honduras; also Cuba and Isle of Pines. Winters from s. British Columbia to California, New Mexico, and Texas, in the Mississippi and Ohio valleys, and coastally from Maryland to Texas, thence through Mexico to Panama; also n. Bahamas, Greater Antilles, and Bermuda (casually).

TEXAS: *Breeding:* Collected in Baylor (eggs), Cameron (eggs), Hidalgo (eggs), and Brewster cos. *Winter:* Taken north to Childress (May 12), east to Harrison (Oct. 28), south to Calhoun and Cameron, west to Culberson (Mar. 24) cos.

NESTING: *Nest:* Singly or in colonies; in prairie marshes, along streams, about marshy lakes or sloughs, on ground in or near water; sometimes floating and fastened to adjoining vegetation; rather loosely built platform hollowed at top for eggs; composed of reeds, rushes, flags, grass, weed stems, moss, and other marshy vegetation; lined with blades and softer portions of marsh plants. *Eggs:* 6–22, usually 8–12; ovate, sometimes toward ovoid; cream white to clay color, pale grayish or pinkish buff, or cartridge buff; small spots of dark brown or black more or less uniformly distributed over entire egg; average size, 49.0 × 33.5 mm.

Jaçanas: Jacanidae

JACANA, *Asarcia spinosa* (Linnaeus)

SPECIES ACCOUNT

Jacana spinosa of A.O.U. check-list, 1957 (see Appendix A). A rather small, delicate marsh bird with moderately long, raillike bill; long greenish legs with extremely long toes and toenails. In flight or on lifted wing, greenish yellow primaries and secondaries are especially conspicuous. *Adult*: yellow bill, frontal shield (3-lobed in Central American race), and wing-spur; dark maroon above and below with black head, neck, breast. *Immature*: orange brown bill; rudimentary frontal shield and wing-spur; grayish brown above with black nape and streak behind eye; white below, narrowly black on sides. Length, 9½ in.; wingspan, 12¼.

RANGE: Irregularly from coastal plain of Texas, but chiefly in lowland Tropics from s. Sinaloa and Tamaulipas through Mexico and Central America to Colombia, Ecuador, n. Argentina, and Uruguay; also Greater Antilles.

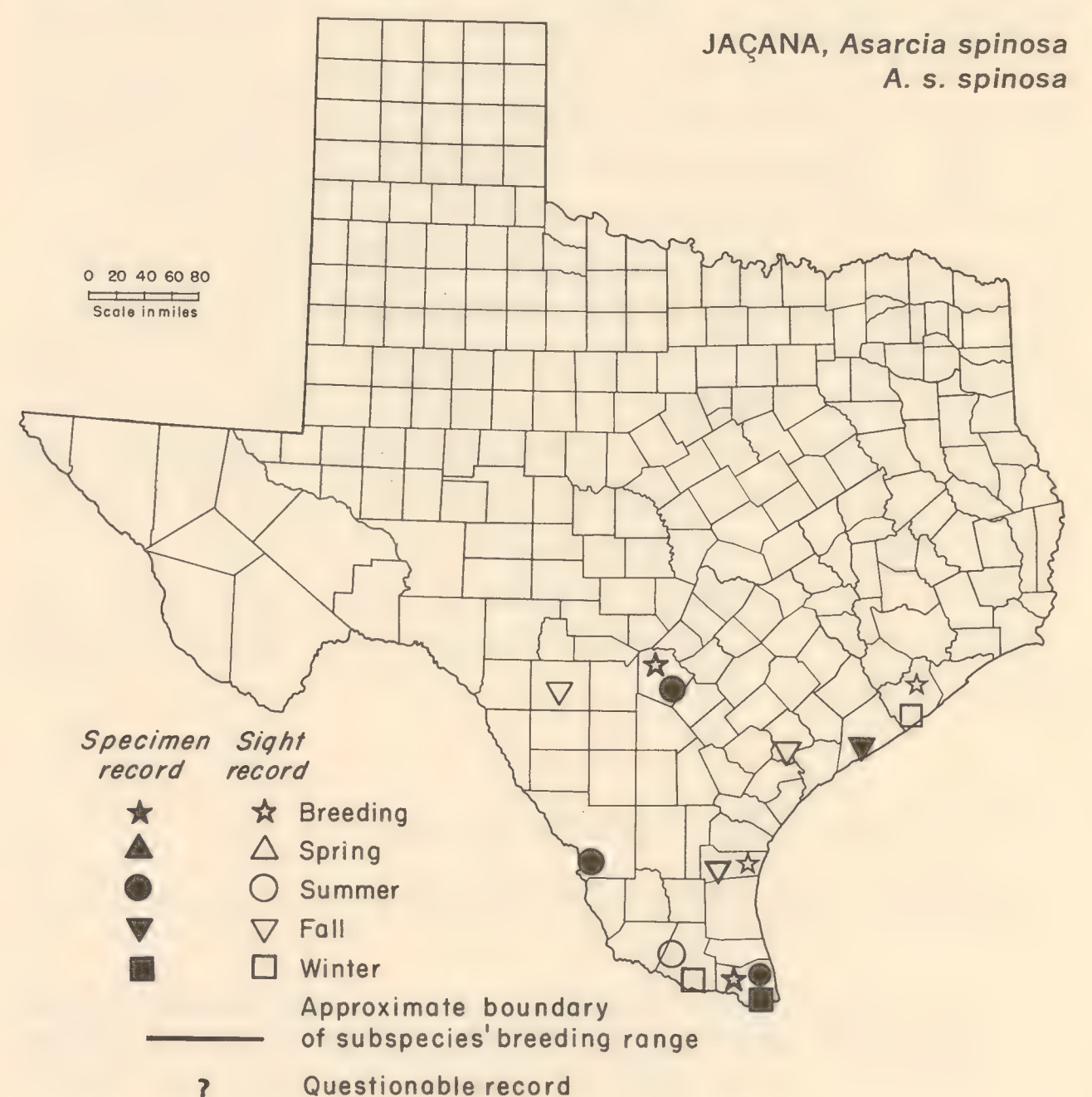
TEXAS: (See map.) *Breeding*: Five localities: Cameron Co., near Olmito (young, Oct. 2, 1938, L. I. Davis); Cameron Co., 6 mi. south of San Benito (3 downy young, Aug. 24, 1951, L. C. Goldman); Kleberg Co., small marsh just west of Cayo del Grullo about 4 mi. north of Vattmannville (chick, Aug. 1–Sept. 5, 1968, G. W. Blacklock, S. F. Labuda, Jr., et al.; substantiated on color film by L. T. Adams); Bexar Co., Mitchell Lake (nest with 3 eggs, June 25, 1922, R. W. Quillin); Brazoria Co., Maner Lake Club, 9 mi. northwest of Angleton (3 immatures said to have hatched on the lake, summer 1971, and 3 young seen, July, 1972, Mr. and Mrs. J. J. Jones, R. J. Fleetwood, et al.; birds apparently resident on lake since at least 1967; that year 1 adult and 1 young shot; 1 was eaten but the other was preserved in freezer for two years until properly identified). *Dispersal*: Rare visitor in Rio Grande delta; casual elsewhere in south Texas brush country north to Uvalde (U.S. Fish Hatchery), San Antonio, and Victoria, and along coast to Brazoria Nat. Wildlife Refuge. *Winter*: Rare, at least formerly, in Rio Grande delta; Maner Lake population (at least 6 individuals) apparently resident (observed, winter of 1971–72).

HAUNTS AND HABITS: The slender, thin-necked Jaçana is a marsh inhabitant whose grotesquely long toes and

toenails help it walk agilely on floating vegetation—pads of lily, lotus, waterlettuce, waterhyacinth, etc.—that grows profusely in quiet fresh water of tropical lowlands. This curious strolling has inspired the colloquial names “lily trotters” and “lotus birds” for the Jacanidae, a pantropical family of seven members. The Jaçana places its nest raft among pond and resaca plants, but it is exceedingly rarely that a stay-at-home Texan is able to witness the henpecked male incubating the fantastically scrawled eggs or tending the equally “artistically” decorated chicks.

As is true of many other long-legged water birds, such as herons, egrets, storks, ibises, and spoonbills, most postnuptial northward wanderers are in immature plumage; thus, about 75 percent of the few Jaçanas seen in Texas are young. The present bird usually appears singly but near other freshwater marsh inhabitants—especially Least Grebe, Purple and Common gallinules, and American Coot.

Raillike flight with dangling feet is seldom sustained; movement is generally confined to short gliding launches, usually low to the ground or water. Birds, on shore, wading, or striding on floating plants, forage for mi-



nute snails, fish, insects, seeds, and bits of vegetable matter. Like a huge bright butterfly, the Jaçana habitually raises and poises its wings vertically upon alighting. Also in threat and perhaps other displays, the bird slowly lifts its wings to reveal the startling wing-spurs and showy greenish yellow flight feather pattern. The stout, sharp golden spur on each adult's wing joint apparently enhances the intimidating effect of the sharp yellow beak and frontal shield. Females, though colored like males, are larger and somewhat more aggressive. In territorial scuffles it is rare for either sex to draw blood—property disputes are ordinarily settled by bluff alone. Jaçanas swim and dive; an extremely frightened or wounded bird will sometimes retreat below the water's surface where, with its feet, it clutches any available vegetation.

As they fly, Jaçanas cackle noisily; the standard alarm is a plaintive whistle. A squeaky, reedy *quee quee quee* is frequently heard (L. I. Davis).

DETAILED ACCOUNT: ONE SUBSPECIES

CENTRAL AMERICAN JAÇANA, *Asarcia spinosa spinosa* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired probably by wear from winter plumage. Head, neck, upper back, and breast black with metallic dark green or purplish gloss; back, scapulars, tertials, and lesser median wing-coverts bay, glossed or mixed with maroon; rump and upper tail-coverts dark maroon; tail purplish black; greater wing-coverts dark purplish brown or blackish maroon; primaries and secondaries lime green, primaries edged externally on terminal portion with fuscous; sides of body dull maroon; middle of lower breast and upper abdomen brownish maroon, middle of lower abdomen fuscous; lower tail-coverts fuscous black, tinged with maroon; lining of wing maroon, externally purplish brown. Bill and frontal shield cadmium yellow, but base of bill bluish white; space between maxilla and frontal shield dark carmine, bright carmine, or violet pink; iris vandyke brown or dull olive; wing-spur cadmium orange; legs and feet sage green or slaty green; claws mummy brown. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Identical with adults in winter.

First nuptial: Acquired by wear from first winter, with which it is practically identical, except for lighter colors due to fading. *First winter:* Acquired by wear from juvenal, with which it is identical, except for somewhat lighter colors. *Juvenal:* Acquired by complete postnatal molt. Frontal shield less developed than that of adult; top of head grayish brown; broad superciliary stripe buffy white, cinnamon buff posteriorly, and almost meeting its fellow across hindneck; nape dull black, this color extending on each side of neck in narrow stripe to eye; rest of upper parts dull buffy brown, feathers tipped with dull cinnamon, buff, or pale buff, rump hazel; chin, cheeks, and throat buffy white; jugulum and upper breast light cinnamon buff; abdomen and crissum buffy white; sides of body narrowly and lining of wing fuscous black; tail fuscous; wing-quills similar to those of adult, but terminally somewhat mottled with fuscous; upper wing-coverts light dull grayish brown, obscurely tipped with pale buff or cinnamon buff. Bill orange brown, but sides of base bluish white, and dull red at base of frontal shield; frontal shield and rudimentary wing-spurs yellowish green; iris olive brown; legs and feet olive green, but toes olive brown on terminal portion. *Natal:* Top of head orange tawny; hindneck dull black; back and scapulars orange tawny, striped with black and buff; wings tawny, tips white; forehead, sides of face, and lower parts white, with black postocular stripe; thighs black.

MEASUREMENTS: *Adult male:* Wing, 112.0–124.0 (average, 119.6) mm.; tail, 38.1–45.0 (41.1); bill (exposed culmen), 28.9–31.0 (29.9); height of bill at base, 7.1–8.4 (7.9); tarsus, 46.5–55.1 (52.1); middle toe without claw, 45.0–54.1 (51.3). *Adult female:* Wing, 130.0–138.9 (135.4); tail, 42.9–52.1 (46.5); bill, 31.0–34.5 (32.8); height of bill, 8.6–9.9 (9.1); tarsus, 51.1–56.9 (54.3); middle toe, 48.5–55.9 (53.3).

RANGE: Locally from s. Texas (irregularly), south along tropical coastal plains of Pacific (from Sinaloa), Gulf of Mexico, and Caribbean to Panama.

TEXAS: *Breeding:* Collected during the breeding season in Cameron (6 specimens) and Bexar (1 found dead) cos. Two birds shot in Brazoria Co., but neither preserved (see species account). *Dispersal:* One specimen: Webb Co., Cactus (June 15, 1890, H. P. Attwater). One captured (specimen?): Matagorda Co., Matagorda (Oct. 8, 1936, identified by H. H. Kimball). *Winter:* Two specimens: Cameron Co., Brownsville vicinity (Dec. 10, 1888, J. A. Singley; Jan. 19, 1889, F. B. Armstrong).

NESTING: *Nest:* In marshes, on or among leaves of marsh vegetation, such as grasses and waterlilies; frail raft, usually floating among vegetation; composed of weeds, bits of leaves of various water plants, and rubbish. *Eggs:* 3–5, usually 4; ovate to short ovate or rounded ovate; glossy; isabella color, chamois, light drab, or tawny olive; with scrolls, blotches, and lines of dark brown or black; average size, 29.9 × 23.1 mm.

Oystercatchers: Haematopodidae

AMERICAN OYSTERCATCHER, *Haematopus palliatus* Temminck

SPECIES ACCOUNT

A very large, squat shorebird; has long, laterally compressed, blunt-tipped, red bill; red eye-ring; yellow eyes; pale-flesh-colored legs; in flight, reveals white secondaries and base of tail. *Adult*: dark grayish brown back; black head, neck; white on remaining under parts. *Immature*: browner on back; whitish forehead; brown bill, eyes. Length, 18½ in.; wingspan, 35; weight, 1½ lbs.

RANGE: On coasts from n. Baja California to Ecuador (including Galápagos Islands) and s. Chile, and from New Jersey and Gulf states along warm beaches to c. eastern Argentina; also West Indies.

TEXAS: (See map.) *Breeding*: Early Feb. to mid-July (eggs, Mar. 29 to June 10; young as early as Mar. 17) just above sea level. Fairly common to uncommon along central coast, nesting regularly; scarce to rare on upper and lower coasts, nesting locally. *Winter*: Early Nov. to late Jan. Irregularly uncommon to scarce along central coast; rare on upper and lower coasts.

HAUNTS AND HABITS: The American Oystercatcher, unlike many protectively plumaged shorebirds, can hardly be overlooked on its preferred open beaches, tidal flats, and almost-awash oyster shell reefs. Large, plump, vociferous, and boldly patterned, this spectacular bird is the sole Texas representative of its six-member world family. During the breeding season, pairs scatter widely and are less easily observed, but the species is somewhat gregarious at other times of the year. However, the American Oystercatcher in Texas, at least in the twentieth century, has not been numerous enough to gather into flocks of one hundred or more as does the European Oystercatcher, *Haematopus ostralegus*.

Although large-bodied, this bird is strong, swift, and graceful in flight; the flashing black-and-white wings and straight heavy red bill are distinctive as it flies low, sometimes high, over surf and sand. Along beaches, the oystercatcher walks deliberately, stopping to probe for marine worms, mussels, clams, snails, crabs, and other mollusks and crustaceans. Conspicuous oblong pocks, sometimes two or three inches deep, in hard-packed mud or sand reveal where this bird has been stabbing

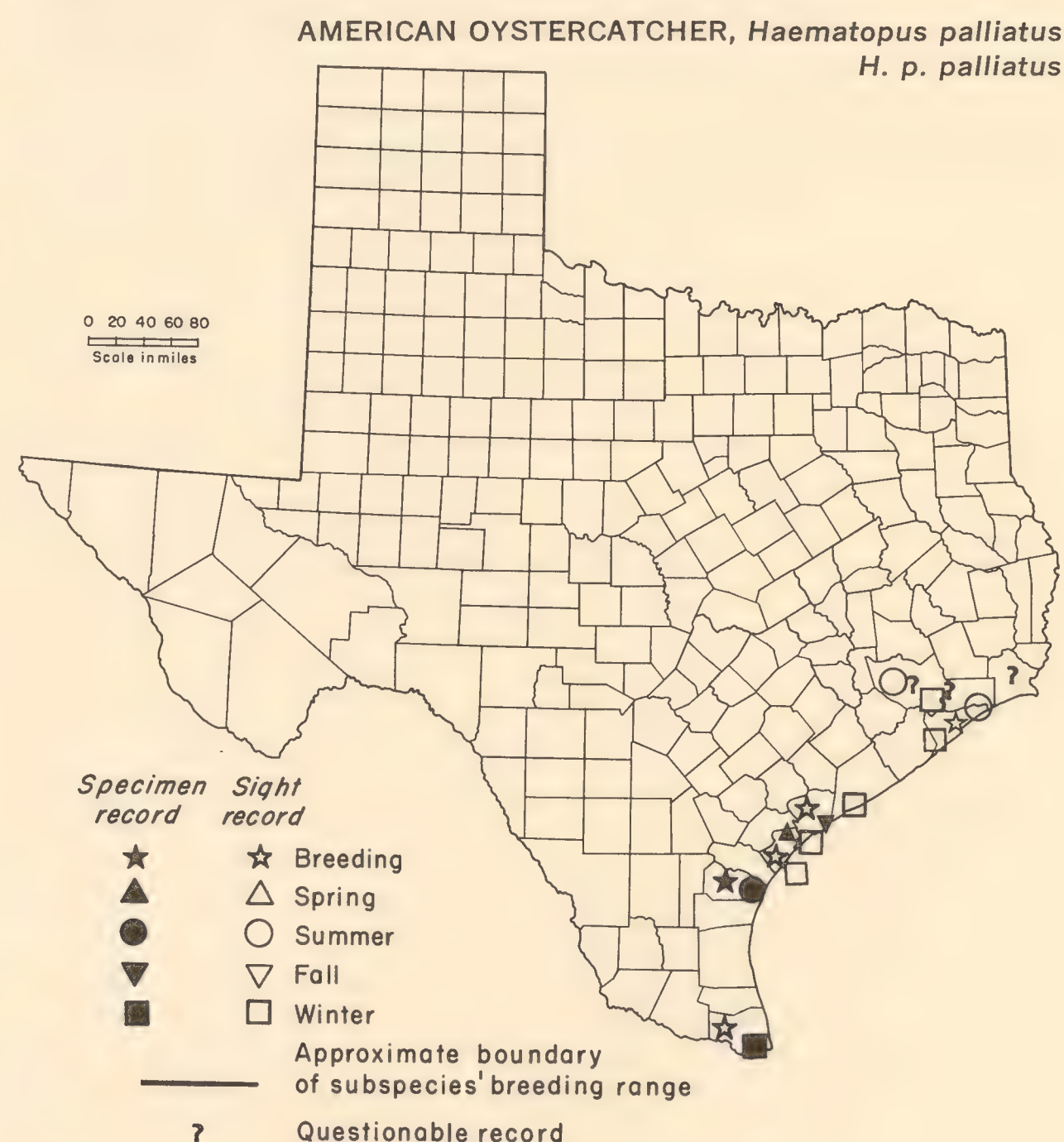
its laterally compressed bill. At low tide, individuals forage on exposed oyster beds. As a bivalve gapes to release water, the oystercatcher, demonstrating another of its several feeding methods, wedges its flat, chisel-shaped bill into the shell, quickly severs the mollusk's adductor muscles, and then devours its powerless prey. Birds wade at times to breast-height in shallows and are fully capable of swimming and diving when necessary.

A protesting American Oystercatcher sounds piercing *wheep, wheep, wheep!*'s, especially when intrusions are made in the vicinity of its nest; another alarm whistle is a loud *pic, pic, pic*. A musical, ploverlike, trilled *cle-ar* apparently serves as the springtime equivalent of song.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN AMERICAN OYSTERCATCHER, *Haematopus palliatus palliatus* Temminck

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Head and neck dull black, chin and throat



somewhat brownish, and short streak on lower eyelid white; back, rump, scapulars, tertials, and lesser wing-coverts warm hair brown; upper tail-coverts white, sometimes with dark brown spots; base of tail white, middle part like back, terminal portion fuscous black; wing-quills and primary coverts fuscous black, inner secondaries white on base of inner webs, and with spot of white on subterminal portions; secondaries and greater coverts mostly white, outer secondaries broadly tipped with fuscous; lining of wing and remainder of lower parts white; outer lower wing-coverts slightly spotted with fuscous. Bill vermilion red but darker in middle, basal portion orange-red, tip yellow or pale salmon; bare portion of eyelids vermilion; iris gamboge yellow, chrome yellow, red, or orange; legs and feet pale flesh color, pinkish white, or vinaceous buff; claws blackish slate but cinereous at base. *Adults, winter*: Attained by complete postnuptial molt. Similar to nuptial adults, but brown feathers of back and scapulars narrowly edged with pale brown or dull gray. *First nuptial*: Acquired by partial prenuptial molt. Same as nuptial adult, except for more brownish lesser wing-coverts. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but upper wing-coverts, tail, and most of scapulars brown like those of juvenal. Bill somewhat more slender. *Juvenal*: Acquired by complete postnatal molt. Head and neck dull black; crown and cheeks spotted with russet; forehead and superciliary stripe grayish white; neck mixed dull gray and dull black; upper parts fuscous, feathers margined with cinnamon or cinnamon russet; wings much as in adults; chin, throat, and jugulum bister or sepia, mottled with dull buff or cinnamon; remainder of lower parts white. Bill brown; iris brown; feet pale dull gray. *Natal*: Head and neck white, dull brown, or buffy gray, finely

mottled with fuscous; narrow postocular stripe and loreal spot black; rest of upper parts buffy gray, finely mottled with black or fuscous, and with two stripes of black extending from upper back to rump; chin and throat mouse gray, slightly mixed with white; remainder of lower parts white. Bill dark brown, basal half of mandible dull orange; iris dark brown; legs and feet flesh color.

MEASUREMENTS: *Adult male*: Wing, 246.1–258.0 (average, 253.0) mm.; tail, 94.0–103.1 (98.3); bill (exposed culmen), 76.5–86.1 (81.3); height of bill at base, 13.0–14.0 (13.5); tarsus, 53.6–57.9 (56.1); middle toe without claw, 37.6–41.4 (40.1). *Adult female*: Wing, 256.0–269.0 (260.4); tail, 99.1–104.9 (102.4); bill, 86.1–90.9 (88.6); height of bill, 13.0–14.0 (13.5); tarsus, 53.1–57.9 (55.6); middle toe, 39.1–42.9 (40.6).

RANGE: Locally on coasts from New Jersey, Florida, and Texas to Yucatán, Venezuela, and n.e. Brazil, and from Isthmus of Tehuantepec to Colombia. Winters coastally, chiefly from Virginia southward through breeding range.

TEXAS: *Breeding*: Collected along coast in Calhoun, Aransas, Nueces, and Cameron cos. *Winter*: No specimen for Nov., Dec., or Jan. (see species account); one late winter specimen: Cameron Co., Port Isabel (Feb. 16, 1881, M. A. Frazar).

NESTING: *Nest*: On sandy beaches or among sand dunes; on ground, usually among shells, bits of driftwood, or pebbles, often on small mounds; shallow depression in sand, usually without nest material but sometimes with pieces of shells, apparently as decoration. *Eggs*: 2–4, usually 2–3; ovate to elongate ovate; slight gloss or none; cream buff, brownish buff, or deep olive buff; spotted and blotched with black, shades of dark brown, and with a few shell markings of lavender; average size, 55.9 × 38.9 mm.

Plovers: Charadriidae

PIPING PLOVER, *Charadrius melodus* Ord

SPECIES ACCOUNT

A small "ringed" plover with a stubby black-tipped yellowish bill which is black in winter; yellowish orange legs. *Nuptial*: light brownish gray above with black band on forecrown; white below with one black breast-band (sometimes narrow or incomplete medially). *Winter*: lacks black on crown; breast-band reduced to light brownish gray patch on each side of breast. Length, 7¼ in.; wingspan, 15¼; weight, 3 oz.

RANGE: Locally from c. Alberta and s. Manitoba to n. Great Lakes region and s. Quebec, south to c. Nebraska and shores of lakes Michigan and Erie; also on coast from s.w. Newfoundland to Virginia. Winters coastally from Texas and Florida to South Carolina; rarely in Bahamas and Greater Antilles.

TEXAS: (See map.) *Migration:* Early Mar. to mid-May; late July to late Oct. (extremes: mid-Feb., early June; July 18, late Nov.). Common (some years) to uncommon along upper and central coasts; uncommon to scarce on lower coast; rare and local inland through eastern half; casual at Midland (1 on Aug. 21, 1960, W. L. Ammon, J. E. Galley). Mid-summer stragglers irregularly recorded along coast from June 13 to July 18. *Winter:* Dec. to late Feb. Common locally (some years) to uncommon along upper and central coasts; irregular on lower coast, where normally scarce.

HAUNTS AND HABITS: Protective coloration reaches near perfection in the Charadriidae, a cosmopolitan family of some sixty members. The Piping Plover is no exception: Its black neck-ring worn in spring—when the bird most needs to be inconspicuous—tends to break the outline of an incubating or brooding individual, making it appear very unbirdlike. Also, its pale mantle matches its preferred nesting habitat: pale dry sand from dunes to high-water mark that borders large lakes and seas. The species breeds on these narrow, sparsely vegetated tracts; the nest is a mere hollow in loose sand, sometimes lined with pebbles and bits of broken shell. Individuals leave the breeding grounds early for the short migration to Gulf of Mexico and West Indian wintering beaches; likewise, this plover is one of the first birds to return north in spring. In Texas, both transients and winter Pippings hug the Gulf coast; individuals occur inland only casually. These plovers usually disperse to feed. Thus, in this state dur-

ing the cool months, birds are observed singly or occasionally in small flocks.

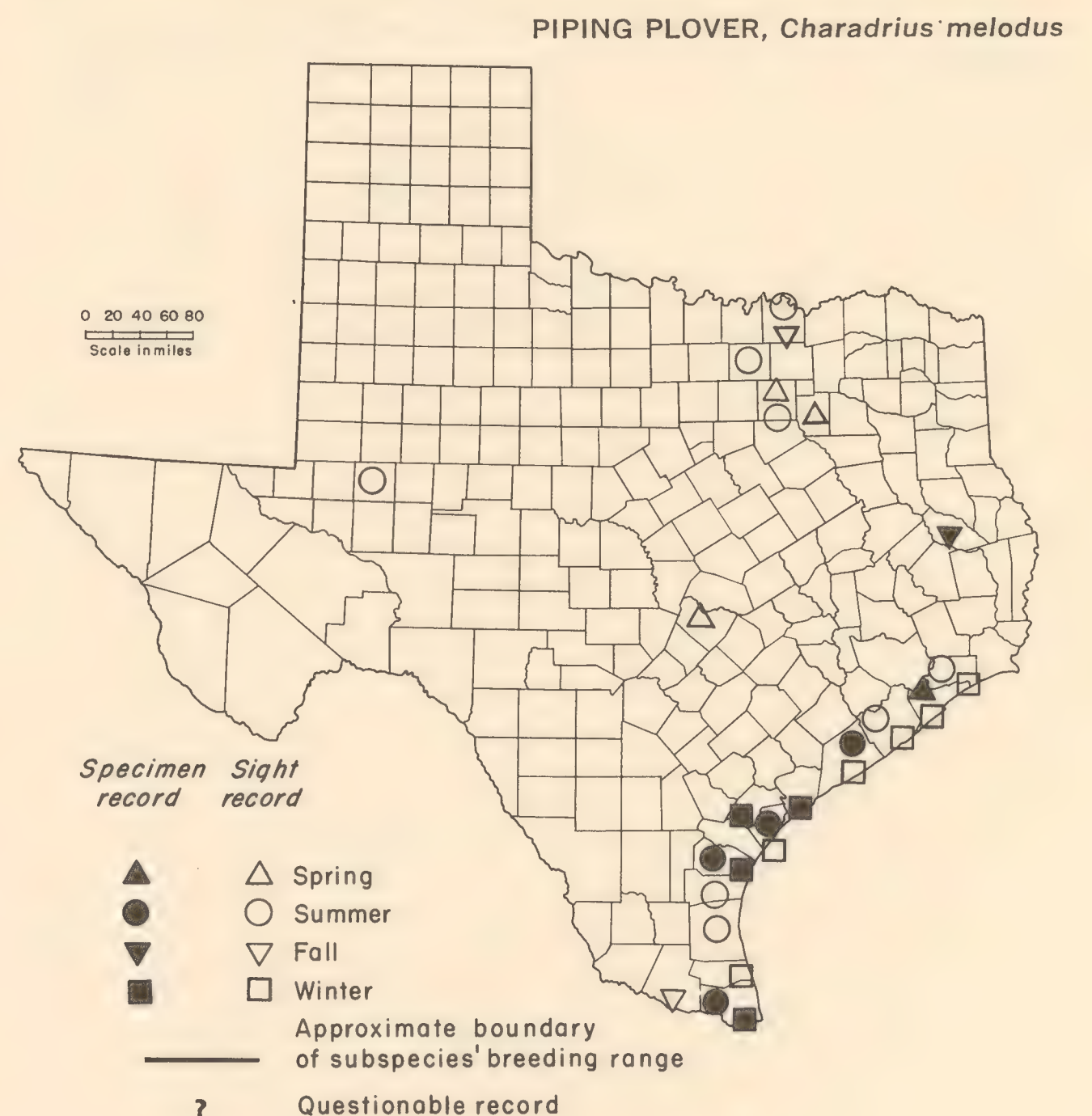
On the wing, the Piping is erratic but swift and agile. A diagnostic trait of this and other plovers is the peculiar run-and-halt foraging habit. A Piping sprints along the beach, brakes suddenly to inspect the territory (apparently for both prey and danger), then continues its twinkling pace. It picks up marine worms, fly larvae, beetles, small crustaceans, and mollusks as it starts and stops its way on wet sand at water's edge or on flats at low tide.

The melodious call of the Piping Plover is a soft, bell-like whistle: *peep-lo* (the *lo* descending), which is frequently expanded to *peep peep peep peep-lo*. Often sounded in flight is a series of whistles which usually descends in pitch.

DETAILED ACCOUNT: ONE SUBSPECIES

BELTED PIPING PLOVER, *Charadrius melodus circumcinctus* Ridgway

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead, superciliary stripe, lores, and



cheeks white; a band across fore part of crown black; top of head, auricular region, postocular region, and pileum pale grayish brown or brownish gray; collar on hindneck white; below this a narrow black collar; remainder of upper surface like crown; middle upper tail-coverts darker basally, tinged with buff terminally; lateral coverts white; tail white basally, all middle feathers broadly tipped with white and with a broad subterminal band of fuscous; wing-quills fuscous; subterminal part of shafts of primaries white, inner primaries with white subterminal portion on their outer webs, secondaries mostly white; wing-coverts mostly like back; greater coverts partly or wholly fuscous and tipped with white; remainder of lower parts white except for band of black across jugulum, this varying in width and occasionally narrow in middle. Bill black terminally, basally pure orange, orange-yellow, dull orange, or orange buff; bare edges of eyelids maize yellow or orange; iris dark vandyke brown or brownish black; legs and feet orange-yellow, buff, or ochraceous buff; claws black. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but black band on crown usually narrower; jugular band narrower and more or less interrupted medially. Bill black at tip, yellow, orange buff, or dull orange at base; eye-ring orange-yellow; inside of mouth and tongue orange buff; iris black; legs and feet orange buff or yellow; claws black. *Adult male and female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but with no black on crown; jugular collar reduced to light brownish gray patch on each side of breast. Bill black, but base of mandible and tinge on base of maxilla dull orange; eye-ring faintly yellow; legs and feet dull orange; claws black. *Male and female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but upper wing-coverts and scapulars mostly retained from juvenal and often considerably faded. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but upper parts rather lighter, the feathers margined with dull white or pale buff. Bill black or slate black, but base of mandible ochre yellow or orange; tongue and inside of mouth white; eye-ring lemon yellow; iris seal brown; legs and feet buff or dull yellow; claws black or slate black.

MEASUREMENTS: *Adult male*: Wing, 116.1–124.0 (average, 119.6) mm.; tail, 48.0–56.9 (52.8); bill (exposed culmen), 11.4–13.5 (13.0); height of bill at base, 4.8–6.1 (5.6); tarsus, 22.1–24.9 (23.6); middle toe without claw, 14.0–16.0 (15.0). *Adult female*: Wing, 110.0–118.1 (114.0); tail, 48.0–52.6 (50.3); bill, 11.7–14.0 (12.7); height of bill, 5.1–6.1 (5.3); tarsus, 21.1–23.9 (22.9); middle toe, 14.0–16.0 (14.7).

RANGE: Locally from c. Alberta and s. Manitoba to s. Quebec, south to c. Nebraska and shores of lakes Michigan and Erie. Winters coastally from Texas to n.e. Florida.

TEXAS: *Migration*: Collected along coast northeast to Galveston, southwest to Cameron cos. One inland collection (not identified to race but most likely *circumcinctus*): Angelina Co., Sam Rayburn Reservoir (Sept. 4, 1972, C. D. Fisher; Stephen F. Austin State University collection). *Winter*: Taken along coast northeast to Calhoun, southwest to Cameron cos.

SNOWY PLOVER, *Leucopoliis alexandrinus* (Linnaeus)

SPECIES ACCOUNT

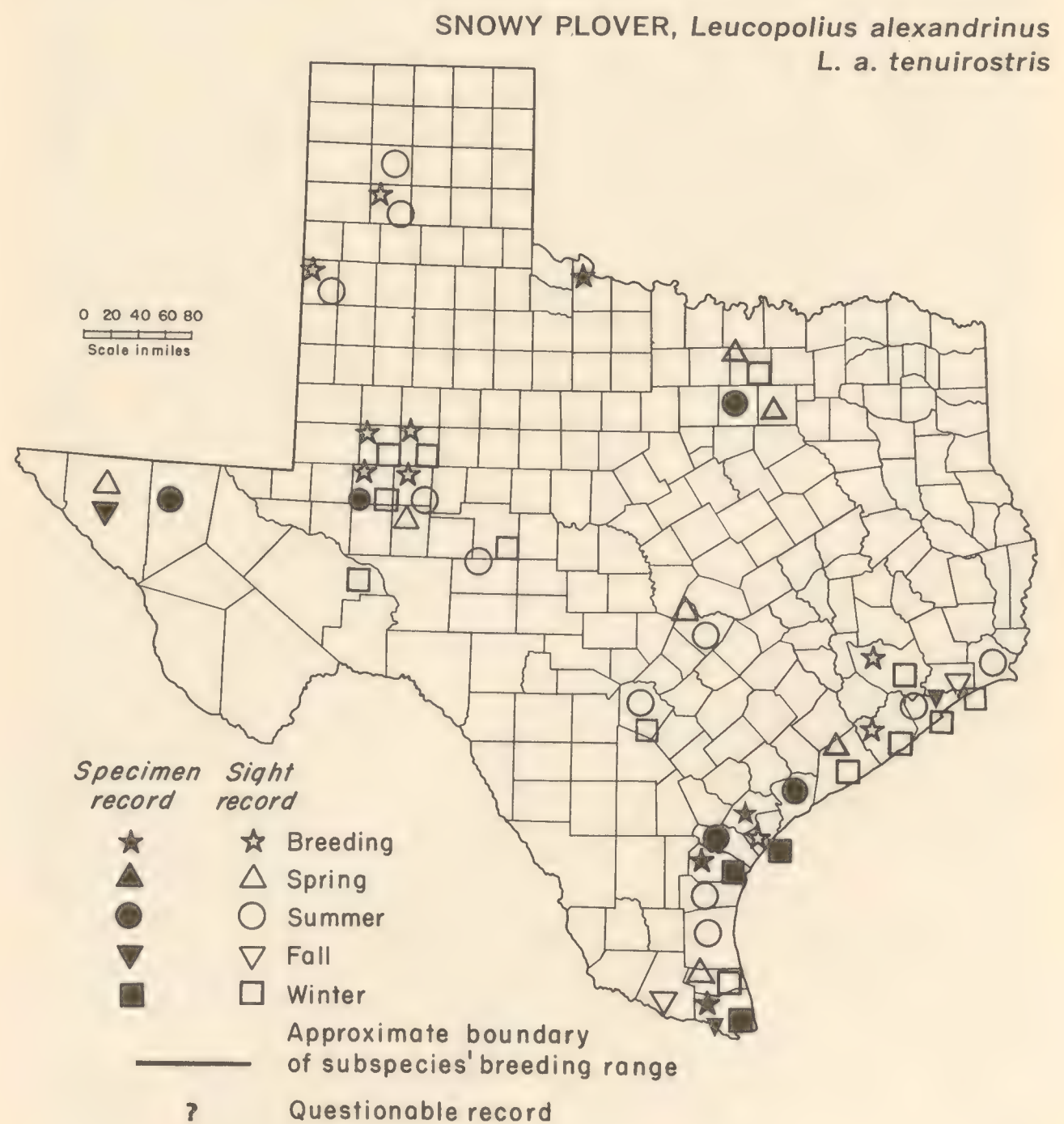
Charadrius alexandrinus of A.O.U. check-list, 1957 (see Appendix A). Kentish Plover of British authors. A tiny pale plover with a relatively long, thin, black bill; dusky legs. *Nuptial adult*: very light brownish gray above with black patch on forecrown, blackish spot behind eye; white below with a short black stroke (possibly a vestigial breast-band) on each side of

breast. *Winter adult and immature*: black markings replaced by brownish gray. Length, 6½ in.; wingspan, 13½.

RANGE: Widely distributed in warmer parts of all continents (except Antarctica) and on many islands. In New World, from w. United States, south to Baja California, and from Gulf states to n. Tamaulipas (possibly); on coasts of Peru and Chile; locally in West Indies. In New World, winters coastally from c. California to Nayarit, and from Gulf states through West Indies to Venezuela and Brazil.

TEXAS: (See map.) *Breeding*: Mid-Apr. to late July (eggs, Apr. 29 to July 11) from near sea level to about 3,900 ft. Fairly common to uncommon along coast from Galveston Bay to mouth of Rio Grande; uncommon and local in and near Panhandle. *Migration*: Mid-Mar. to mid-May; mid-July to mid-Oct.—irregularly a few to mid-Dec. (extremes: mid-Feb., late May; July, Jan. 1). Common to fairly common along coast; fairly common through inland breeding range; uncommon (mainly in fall) to scarce through northern Trans-Pecos, north central portion, eastern edge of Edwards Plateau, and interior Rio Grande delta. *Winter*: Dec. to Mar. Locally fairly common on central coast; uncommon to scarce along remainder of Gulf coast; rare inland near coast. One record from north central Texas: Denton Co., Denton (1 on Jan. 29, 1955, Viola Hamilton, M. K. Rylander).

HAUNTS AND HABITS: Like its Texas coast neighbor, the ghost crab (*Ocypode*), the pale-plumaged Snowy Plover haunts upper beaches and sandy flats free of vegetation and out of reach of the surf's wash; barren sun-bleached shores of large inland alkaline, saline, and fresh lakes attract a few individuals also. The present species, nesting predominantly on Pacific and Gulf



coasts, is the western counterpart of the likewise pale Piping Plover which seeks chiefly Great Lakes and Atlantic beaches. The Snowy appears singly or in small parties; occasionally where it is common, birds forage in bunches as do sandpipers, although the chunky bodies of these plovers should distinguish them.

Snowy flight may be direct or zigzagging, in loose or compact groups. In the vicinity of the nesting or feeding grounds, birds usually fly low to the ground or water. A frightened bird, rather than flying, often vanishes on foot or crouches in the sand to conceal itself. With long strides—interrupted, of course, by the frequent and abrupt plover halts—it moves along flats rapidly. Wave chasing, after the manner of Sanderlings, for tiny mollusks, crustaceans, and marine worms is one method of feeding. Similar food the Snowy also picks up amid sea wrack on dry beaches; it also devours insects, especially flies, drawn to dead fish and other debris not washed out by the tides.

The flutelike vocalization of the Snowy Plover is a low-pitched *poo-weet*, interspersed at times with one or two quiet *grr*'s; in flight it sounds a soft trilling whistle.

DETAILED ACCOUNT: TWO SUBSPECIES

WESTERN SNOWY PLOVER, *Leucopoliis alexandrinus nivosus* (Cassin)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead, superciliary stripe, and sides of head white; band on fore part of crown black; narrow collar around hindneck white or buffy white; remainder of upper surface light brownish gray or grayish brown, pileum often tinged with pale buff, rump and middle upper tail-coverts and sometimes anterior lesser wing-coverts darker, and lateral upper tail-coverts white; tail mostly white, median tail feathers terminally fuscous, middle pair nearly all of this color; primaries fuscous, shafts mostly white, inner webs paler; inner secondaries chiefly white, also most of inner webs of outer secondaries white; sides of head white, but auriculars black; spot on each side of jugulum black; remainder of lower surface white. Bill and bare eye-ring black; inside of mouth pale flesh color; iris vandyke brown; legs slate color, slate gray, smoke gray, or grayish white; claws black. *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but usually with black crown and sides of jugulum duller black or brown. *Adult male and female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but black of crown and sides of jugulum replaced by brownish gray or fuscous. Toes mouse gray. *Male and female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but median and lesser wing-coverts retained from juvenal and with buff edges. *Male and female, first winter:* Acquired by partial postjuvenal molt. Similar to nuptial adult female, but lesser and median wing-coverts with broad buff edgings. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but feathers of upper parts tipped with dull white or dull pale buff. Bill slate black; iris bay; legs pale smoke gray; toes hair brown to chaetura drab; claws black. *Natal* (this plumage of this race not seen in Texas): Crown and occiput pale buff with bars and spots of black or dark brown and a white collar about hindneck; remainder of upper surface like crown; narrow postocular streak black and tiny spot of same color on auriculars; forehead and lower parts white.

MEASUREMENTS: *Adult male:* Wing, 101.1–108.0 (average, 104.4) mm.; tail, 41.9–47.0 (44.7); bill (exposed culmen),

14.5–16.0 (15.2); tarsus, 22.6–24.9 (23.6); middle toe without claw, 14.0–15.5 (14.7). *Adult female:* Wing, 100.1–105.4 (102.9); tail, 41.9–43.9 (43.2); bill, 13.5–15.5 (14.7); tarsus, 22.1–23.6 (22.9); middle toe, 13.5–15.0 (14.2).

RANGE: On coasts from s. Washington to s. Baja California; locally in w. Nevada and s. California (Salton Sea). Winters coastally from n. Oregon to s. Baja California, Sonora, Sinaloa, and Nayarit, also Texas and Veracruz, inland in Guanajuato.

TEXAS: *Migration:* Collected in Tarrant (Aug. 25), Calhoun (Aug. 13), Cameron, Culberson (Aug. 8), and Hudspeth cos. Uncommon. *Winter:* Three specimens: Nueces Co., Corpus Christi (Feb. 14, 1899, M. A. Frazar); Cameron Co. (2 on Dec. 31, 1926, L. W. Wing).

NESTING: (This race does not nest in Texas.) *Nest:* On beaches of ocean, sea, or lake, or on flats along streams; on ground, usually where there are many shells, pebbles, and other debris; in depression in sand, lined sparsely with broken shells, fish bones, bits of wood, or other similar rubbish. *Eggs:* 2–3, usually 3; short ovate to ovate; with no gloss; cartridge buff or pale olive buff; thickly spotted or scrawled with black, and with inconspicuous shell markings of pallid mouse gray; average size, 30.2 × 22.4 mm.

CUBAN SNOWY PLOVER, *Leucopoliis alexandrinus tenuirostris* (Lawrence)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *L. a. nivosus*, but upper parts much lighter. *Natal:* Probably similar to *L. a. nivosus*.

MEASUREMENTS: *Adult male:* Wing, 98.6–106.4 (average, 103.1) mm.; tail, 42.9–50.5 (47.0); bill (exposed culmen), 14.7–16.8 (15.5); tarsus, 24.4–26.9 (25.4); middle toe without claw, 13.5–15.5 (14.5). *Adult female:* Wing, 98.1–106.4 (103.1); tail, 41.9–48.3 (45.5); bill, 13.0–16.0 (14.5); tarsus, 23.6–24.9 (24.1); middle toe, 13.0–15.2 (14.2).

RANGE: Very locally from n. Utah to s.w. Kansas, south to e. New Mexico and n. Texas, and on Gulf coast from Texas (possibly n. Tamaulipas) to Mississippi and Florida; also Bahamas, Cuba, Jamaica, Hispaniola, Puerto Rico, and St. Croix. Winters from Florida and Texas through West Indies to Venezuela and Brazil.

TEXAS: *Breeding:* Collected along coast north to Refugio (eggs), south to Cameron cos.; inland in Wilbarger (eggs) and Midland cos. *Migration:* Collected along coast northeast to Galveston, southwest to Cameron cos. Common. *Winter:* Two specimens: Aransas Co., Aransas Bay area (Jan. 1, 1887, J. M. Priour; Feb. 3, 1909, A. Sorenson).

NESTING: Similar to that of *L. a. nivosus*.

SEMIPALMATED PLOVER, *Aegialeus semipalmatus* (Bonaparte)

SPECIES ACCOUNT

Charadrius semipalmatus of A.O.U. check-list, 1957 (see Appendix A). Very similar to, and sometimes merged with, the Eurasian Ringed Plover, *Charadrius hiaticula*. A small “ringed” plover with a stubby black-tipped orange bill; bright orange-yellow legs. *Nuptial:* dark brown above with white forehead framed by black forecrown and lores; also whitish spot behind eye; white below with one black breast-band. *Winter:* black markings replaced by grayish brown; bill usually blackish. Length, 7¼ in.; wingspan, 15¼; weight, 1½ oz.

RANGE: Locally from Alaska, Victoria, and s. Baffin Island, south to Queen Charlotte Islands and n.w. British Columbia, n.e. Manitoba, and s. Nova Scotia;

also Sable Island. Winters coastally from c. California to Ecuador (including Galápagos Islands) and Chile, and from Gulf states and South Carolina to Patagonia.

TEXAS: (See map.) *Migration:* Early Apr. to mid-May; late July to mid-Nov. (extremes: Mar. 17, June 1; July 19, Dec. 30). Very common locally to fairly common along coast; fairly common (mainly in fall) to scarce through much of interior eastern three-quarters; rare and local in Trans-Pecos. Mid-summer stragglers irregularly recorded along coast from June 17 to July 14. *Winter:* Dec. to mid-Mar. Common locally to uncommon along coast.

HAUNTS AND HABITS: The Semipalmated Plover—its back the color of mud or wet sand—disappears easily on the muddy flats where it prefers to feed. The species is an arctic breeder. Pairs incubate their four dark-brown-spotted buffy eggs in a depression, sometimes lined with shells and grass, on a sandy beach often near a piece of driftwood or similar landmark. Migrants and winter residents in Texas are most frequently observed on the Gulf coast; as with many shorebirds, a few linger here into summer. In addition to tidal flats, birds occur in shallow pools of salt marshes; inland transients seek drained lakes, rain-soaked plowed fields, and muddy shores of lakes and rivers. In spring, as is generally true with most waders, this plover seems restless and anxious to return to the nesting grounds, but in fall, movement southward appears more leisurely.

Compact flocks of Semipalmated Plovers twist and turn low over water or ground; however, aerial parties are often loose and disjointed. Birds disperse soon after they alight, rather than forage in groups as do sandpipers. When tide is out, a Semipalmated runs along the shore with head down; it breaks its pace with frequent and sudden stops and assumes

an erect, motionless posture as it looks and listens for prey or enemies. It often jerks and bobs its neck and head as well. Coastal food consists mainly of small mollusks, crustaceans, marine worms, and larvae of salt marsh mosquitoes; locusts, various aquatic insects, and earthworms are consumed inland. When feeding areas are covered by high tide, individuals reconvene on upper beaches where they rest in tight, small, usually quiet clusters.

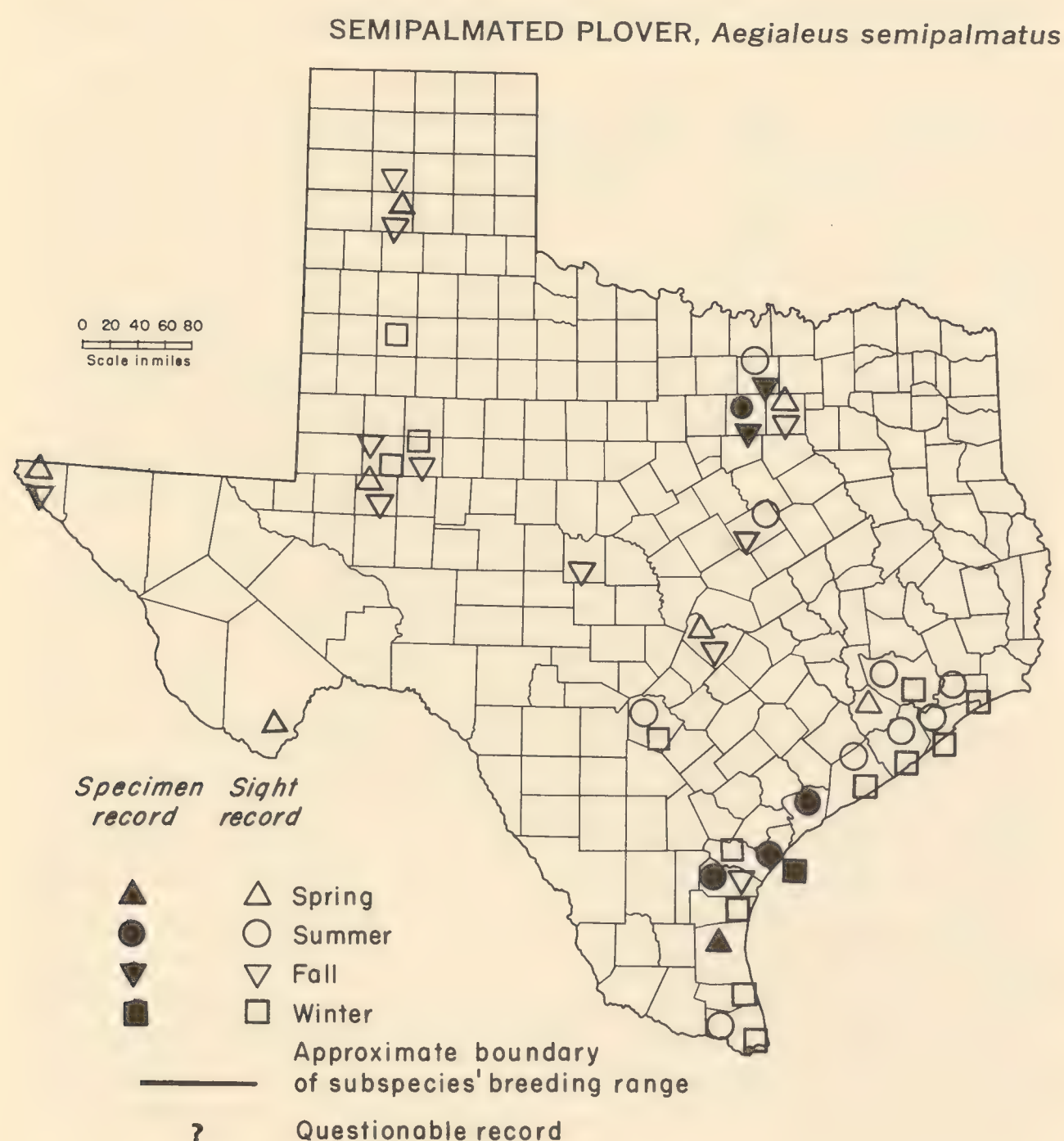
Customary call of the Semipalmated Plover is a plaintive *chee-wee* or *too-li*, the second note higher pitched. In the Arctic, and occasionally on the spring trek north, birds sound the nuptial "song": a whinny that increases in speed toward the end, like a bouncing ball, until notes practically merge into one sound. This is usually uttered on the ground, but sometimes in flight.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead, lores, and fore part of crown black, enclosing white lunate space on forehead; cheeks black with short white streak on lower eyelid and elongated white spot behind eye; crown and occiput, together with remaining upper parts, including wing-coverts and tertials, dull hair brown; lateral upper tail-coverts white; tail white, central feathers dull buffy brown, fuscous black terminally, next pair with white bases passing into buffy brown and subterminally to fuscous black with broad white tips; wing-quills fuscous, tips of primaries dull black, shafts subterminally white, inner webs drab or light fuscous, secondaries mostly fuscous with basally white shafts, inner feathers becoming mostly white; sides of neck and collar about hindneck white; below this a black collar on hindneck and jugulum; remainder of lower parts white. Bill with tip black, and base orange buff or cadmium orange; iris vandyke brown; eyelids picric yellow, chrome yellow, gamboge yellow, or orange; tongue and inside of mouth white; legs and feet cadmium yellow, orange buff, orange, or flesh color; claws black. *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but usually with black markings of head and jugulum duller, jugular band mottled or washed laterally with grayish brown. Bill black, but basal third of mandible and basal mark on maxilla orange; tongue white; legs dull orange to buff; claws black. *Adult male and female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head and jugulum with fuscous, instead of black, markings. *Male and female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults but differ in presence of some juvenal upper wing-coverts. *Male and female, first winter:* Acquired by partial postjuvinal molt. Similar to adults in winter, but with head and part of upper wing-coverts like those of juvenal, the latter with broad buff or buffy white edgings. Bill black, spot on base of mandible raw umber; tongue and inside of mouth white; eye-ring dull chrome yellow; iris vandyke brown; legs and feet raw umber anteriorly, chrome yellow posteriorly. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but feathers of upper surface tipped with pale buff or buffy white. Bill black, but base of mandible orange; iris dark brown; legs and feet slate color or olive yellow anteriorly, orange yellow, olive yellow, or dull white posteriorly; claws black.

MEASUREMENTS: *Adult male:* Wing, 114.0–122.5 (average, 119.4) mm.; tail, 52.1–57.4 (54.8); bill (exposed culmen), 11.4–13.0 (12.4); tarsus, 21.1–23.9 (22.4); middle toe without claw, 16.5–18.0 (17.3). *Adult female:* Wing, 115.1–127.0 (119.6); tail, 52.6–61.0 (55.6); bill, 10.4–13.5 (11.7); tarsus, 21.1–23.1 (21.9); middle toe, 16.5–18.0 (17.0).

TEXAS: *Migration:* Collected north to Denton, south to Cal-



houn (July 26) and Cameron cos. *Winter*: Three specimens: Aransas Co., Aransas Bay (Feb. 21, 22, 1896, G. K. Cherrie; Feb. 12, 1899, F. B. Armstrong).

WILSON'S PLOVER, *Pagolla wilsonia* (Ord)

SPECIES ACCOUNT

Charadrius wilsonia of A.O.U. check-list, 1957 (Oberholser's nomenclatural explanation apparently never written). Thick-billed Plover of some authors. A medium-sized "ringed" plover, larger than Snowy, Piping, or Semipalmated plovers, with a noticeably longer, heavier black bill; grayish-flesh-colored legs. *Nuptial male*: grayish brown above with white forehead extending as stripe over eye, black forecrown and loreal streak; white below with one broad black breast-band. *Female and winter male*: black markings replaced by grayish brown. Length, 7¾ in.; wingspan, 16.

RANGE: On coasts from c. Baja California and c. Sonora to Guatemala, Colombia, and Peru, and from Virginia to Florida and Texas, thence locally (breeding largely uncertain in e. Mexico and on Caribbean slope of Central America) to Grassy Cay (British Honduras), Venezuela, and Guyana; also West Indies. Winters coastally from c. Baja California to Peru, and from Gulf states to c. eastern Brazil; also West Indies.

TEXAS: (See map.) *Breeding*: Early Apr. to early Sept. (eggs, Apr. 7 to July 10; downy young to Aug. 28) just above sea level. Common to fairly common along coast, where recorded regularly from Mar. to Oct. (extremes: Mar. 7, Nov. 20). *Winter*: Nov. 26 to Feb. 18. Irregular; uncommon to scarce along central and lower coasts; rare on upper coast. *Vagrant*: Casual

inland near coast. One sighting from interior: Midland Co., Midland (1 on Aug. 24, 1958, W. L. Ammon, J. E. Galley).

HAUNTS AND HABITS: The Wilson's Plover is a medium-sized member of its family with a distinctively stout, black bill; it is thus known to many bird watchers as Thick-billed Plover. Along coasts, broad open sand flats—often shell- and wrack-strewn—and low spaces between dunes within sound of the surf are prime nesting areas for this species. It winters in similar situations, but in the United States its numbers are considerably reduced during the cool months. On Texas beaches at all seasons, the Wilson's appears less gregarious than many of its seashore relatives.

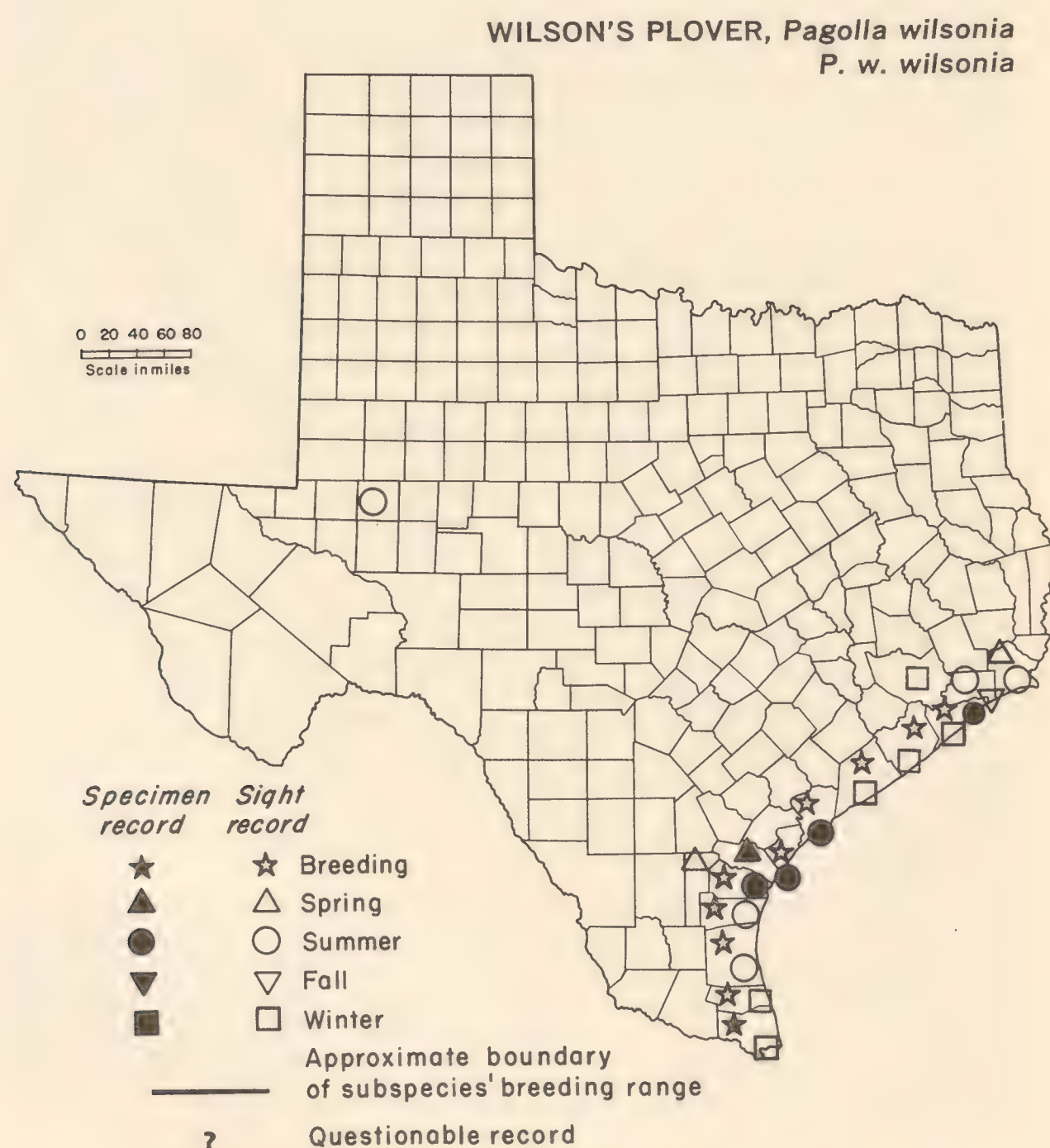
Flight is swift and often prolonged. Usually the bird flies low in the feeding and nesting areas; migrants ascend to greater heights. The Wilson's is generally more easily approached than other shorebirds; nonetheless, when intrusions are made on the breeding grounds, incubating birds are noisy and quick to feign injury. The Wilson's runs and halts in the characteristic plover fashion, but it appears slower and its pauses longer than the dashes and stops of smaller charadriids. As it moves along flats, it snatches small shrimp, crabs, a few mollusks, and flies and other insects; it often feeds at and after dusk like the Killdeer.

On the ground or in flight, the Wilson's Plover utters—usually in alarm—a low, but sharp, musical *whit!* or *wheet!*, which in quality is between a chirp and a whistle. A higher pitched series (*queet, queet, quit it quit it* of one describer) is also whistled. Not much is heard from the Wilson's Plover in Texas even though it nests here.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHEASTERN WILSON'S PLOVER, *Pagolla wilsonia wilsonia* (Ord)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Forehead and superciliary stripe white, becoming buffy posteriorly; short bar on fore part of crown black; remainder of upper surface, including wings, grayish brown; white collar around hindneck interrupted behind; hindneck and sides of head sometimes with a little cinnamon buff or cinnamon; lateral upper tail-coverts brownish white, middle shorter feathers rather darker than back; tail white or buffy white, middle feathers mostly buffy brown, terminally fuscous, other middle feathers paler with narrower terminal fuscous portions; primaries fuscous, inner webs paler, tips dull black, subterminal portion of shafts white; secondaries fuscous, inner secondaries paler and basally white with some white tips on terminal portions of outer webs; greater upper wing-coverts tipped with white or buffy white; lores black; sides of head like crown with narrow white lower eyelid extending slightly behind eye, broad black band across jugulum extending only to sides of neck; remainder of lower parts white. Bill black or dark brown; eyelids dull gray; iris burnt umber; legs and feet light grayish flesh color or drab gray; claws dark brown or black. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but black markings of head and jugulum replaced by fuscous or grayish brown; jugular band sometimes mixed with ochraceous or cinnamon; base of mandible drab gray; legs and feet paler. *Adult male and female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female, but brown of anterior part of crown, loreal stripe, and jugular band more grayish. *Male*



and female, second winter: Acquired by complete postnuptial molt. Like adults in winter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but black markings about head and on jugulum not so fully developed. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to first nuptial male, but dark markings of head and jugulum brown instead of dull black. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial female but duller. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adult female, but upper parts light drab, feathers margined and tipped with pinkish buff or buffy white; jugular band paler, light drab. *Natal*: Crown and occiput mixed pale buff and light pinkish buff, confusedly mottled with black; broad collar on hindneck white; remainder of upper surface similar but more grayish; forehead and entire lower parts white.

MEASUREMENTS: *Adult male*: Wing, 105.9–120.9 (average, 116.3) mm.; tail, 43.9–50.0 (47.5); bill (exposed culmen), 19.6–21.6 (20.6); tarsus, 27.4–30.5 (28.9); middle toe without claw, 18.0–20.1 (19.0). *Adult female*: Wing, 112.0–120.9 (117.9); tail, 41.9–50.0 (46.8); bill, 19.0–22.1 (20.9); tarsus, 26.9–31.0 (28.7); middle toe, 18.0–20.1 (18.8).

RANGE: Locally on coasts from Virginia and Florida to Texas; also n. Bahamas. Winters coastally from U.S. Gulf states (rarely) to Costa Rica, Guyana, and c. eastern Brazil.

TEXAS: *Breeding*: Collected along coast northeast to Galveston, southwest to Cameron cos. *Winter*: See species account.

NESTING: *Nest*: On beaches, often about inlets; on ground strewn with stones, shells, or drift; in slight hollow in sand or mud, indicated sometimes by bits of shell or loose pebbles, which serve for lining. *Eggs*: 2–4, usually 3; ovate to short ovate; cream buff, clay color, or pale olive drab; spotted, lined, and blotched with blackish brown, and with shell spots of light lavender, pale gray, and quaker drab; average size, 35.8 × 26.2 mm.

MOUNTAIN PLOVER, *Podasocys montanus* (Townsend)

SPECIES ACCOUNT

Eupoda montana of A.O.U. check-list, 1957 (see Appendix A). A medium-sized, plain plover without breast-bands; has shortish black bill; pale brownish yellow legs. In flight, shows narrow white wing-stripe; white axillars and wing-linings; whitish-tipped tail with subterminal black band. *Nuptial*: uniformly pale grayish brown above with white forehead and stripe over eye, black forecrown and loreal streak; whitish below with grayish buff wash on sides of breast. *Winter*: buffier; lacks black markings on head. Length, 9¼ in.; wingspan, 19¼; weight, 3 oz.

RANGE: N. Montana, south to c. New Mexico, Trans-Pecos, and Panhandle Texas (at least formerly), and w. Oklahoma. Winters from c. California and c. and coastal Texas to Baja California, Sonora, Zacatecas, and Tamaulipas.

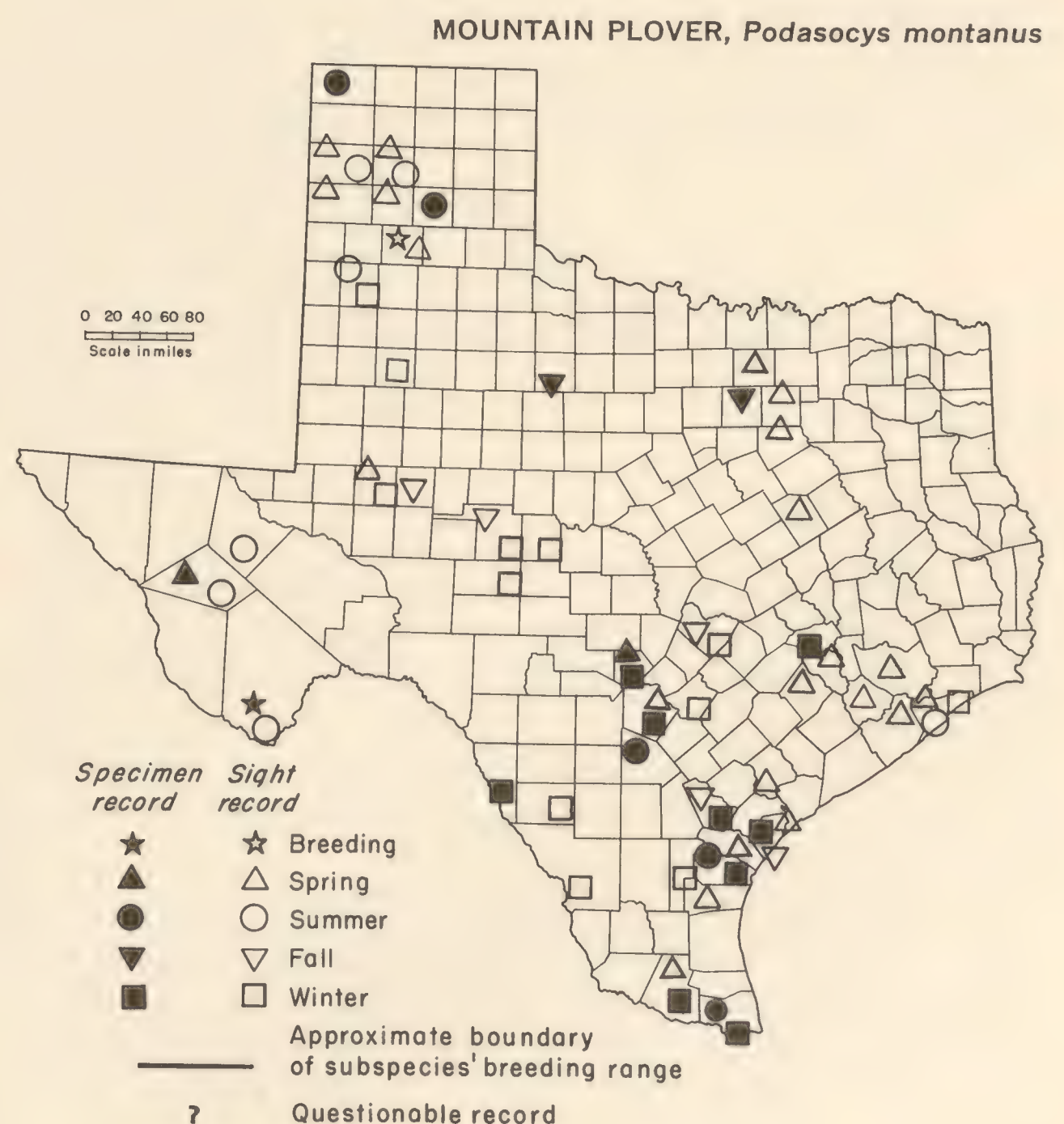
TEXAS: (See map.) *Breeding*: Two records: Swisher Co., 20 mi. south of Canyon (recently hatched young located, May 31, 1899, Vernon Bailey); Brewster Co., Glass Mts. 10 mi. north of Marathon (1 downy young collected, May 26, 1933, G. M. Sutton). Summers irregularly and very locally in northern Panhandle and Trans-Pecos, but recent nesting evidence lacking. *Migration*: Early Mar. to late Apr.—a few to mid-May; early Aug. to late Sept.—a few to late Oct. (extremes:

Feb. 23, June 20; July 25, Nov. 27). Fairly common locally to scarce through much of western two-thirds; rare in spring on upper coast. *Winter*: Early Dec. to late Feb. Irregular; scarce on northwestern Edwards Plateau and central and lower coasts; rare and local in southern Panhandle and south Texas; casual on upper coast.

HAUNTS AND HABITS: The Mountain Plover actually avoids mountains; it was originally named Rocky Mountain Plover because the first specimens were taken within sight of that range. Instead, upland short-grass plains and level plateaus of the western United States are its preferred summer haunts. Some birds occur also on sandy semiarid flats with or without scattered brush and cacti. Ranging the Southwest in winter, birds move toward the Pacific and Gulf coasts but stop short of beaches or allied salt marshes and mud shores. During the cool months, loose flocks work coastal prairies, alkaline flats, plowed fields, and similar open situations. In the 1950's and early 1960's, the Bermuda grass football fields at Seguin, Texas, became quite noted for their wintering Mountain Plovers.

On the wing, the swift-flying Mountain usually alternates wing-strokes with periods of gliding. If alarmed, this long-legged plover first attempts to escape on foot; it flies as a last resort and then only briefly and low to the ground. After alighting, it usually crouches to avoid detection. A foraging bird strides in the start-and-stop manner of plovers as it investigates the ground for grasshoppers, crickets, beetles, and flies.

Feeding Mountain Plovers exchange soft, drawling, rather melodious whistles which become harsh, loud, and higher pitched when sounded as an alarm. Wintering individuals are quiet most of the time.



DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Forehead and superciliary stripe white; broad bar on fore part of crown and narrow loreal stripe black; remainder of upper surface, including wings, buffy grayish brown, hindneck paler and mostly grayish buff; tail light grayish brown, outer feathers mostly white, tips of several middle pairs fuscous black; wing-quills fuscous, paler on inner webs, shafts subterminally white; secondaries becoming buffy white basally and paler brown on inner feathers, inner primaries with basal streak of white on outer webs; sides of head dull buffy white; sides of neck like hindneck but rather darker and duller; lower parts white; breast tinged with grayish buff; lining of wing white. Bill black; iris auburn; legs dull light brownish yellow; feet dark brown; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but black of head absent and most of plumage more heavily tinged with buff. Bill blackish slate; legs pale mouse gray; toes dark mouse gray; claws black. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but some scapulars and upper wing-coverts retained from first winter. *First winter:* Acquired by wear from juvenal, to which it is similar, except for somewhat lighter coloration due to fading and wear. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but sides of head and of neck and hindneck light cinnamon buff; feathers of upper surface margined and tipped with dull pale buff or pinkish buff. *Natal:* Upper parts pale buff or cinnamon buff, much mottled and spotted with black, and on back to some extent with russet; forehead buffy white or buff; lower parts white or pale buff. Bill light brown, paler at tip.

MEASUREMENTS: *Adult male:* Wing, 137.9–153.9 (average, 146.8) mm.; tail, 56.9–69.1 (65.3); bill (exposed culmen), 19.0–22.1 (20.9); tarsus, 37.1–40.4 (38.4); middle toe without claw, 17.5–19.6 (18.3). *Adult female:* Wing, 143.0–154.9 (148.4); tail, 61.0–67.1 (64.3); bill, 21.1–22.6 (21.9); tarsus, 37.1–39.1 (38.4); middle toe, 17.0–20.1 (18.5).

TEXAS: *Breeding:* See species account. *Migration:* Collected north to Dallam (Aug. 6), east to Tarrant, south to Nueces (July 25) and Cameron, west to Jeff Davis cos. *Winter:* Taken north to Kendall and Washington, south to Refugio and Cameron, west to Maverick cos.

NESTING: *Nest:* On dry plains or open prairies; in slight hollow in ground; lined with rootlets and grasses. *Eggs:* 2–4, usually 3; ovate to short ovate; not glossy; brownish drab, olive drab, or chamois, sometimes pinkish cinnamon, with small rounded spots of blackish brown and scrawls of black; average size, 37.3 × 28.2 mm.

KILLDEER, *Oxyechus vociferus* (Linnaeus)

SPECIES ACCOUNT

Charadrius vociferus of A.O.U. check-list, 1957 (see Appendix A). Only U.S. plover with two black breast-bands; has rather short, black bill; reddish orange eye-ring; longish, pale yellow or flesh-colored legs. In flight, shows white wing-stripe; bright rufous rump; white-edged black tail. Uniformly brownish gray above with black-and-white facial markings; white below except for the two bands. Length, 10 in.; wing-span, 20¼; weight, 3¾ oz.

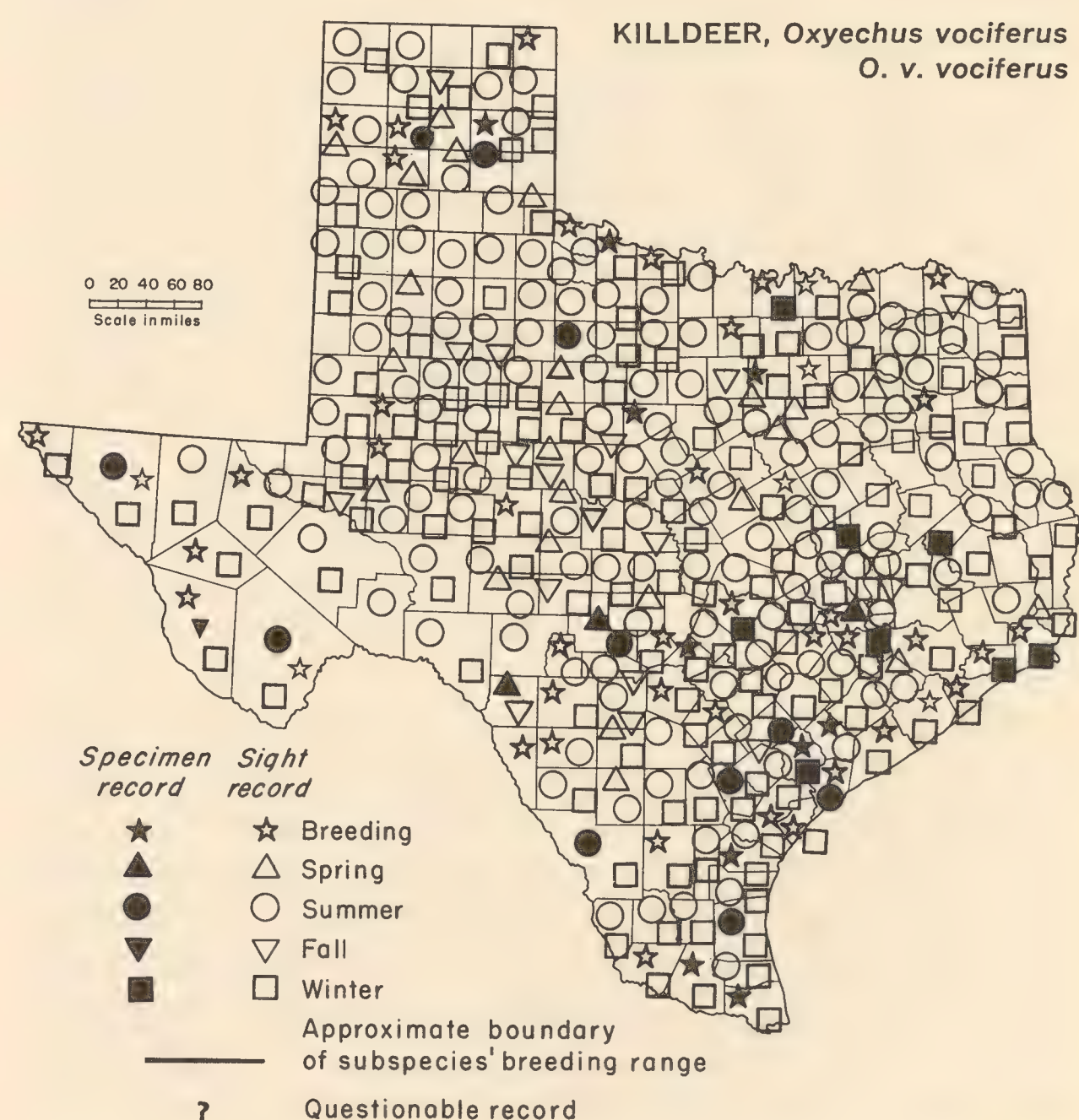
RANGE: N.w. British Columbia to New Brunswick, south through United States to c. Mexico, also Bahamas and Greater Antilles; and coastally from n. Peru to extreme n. Chile. Winters from s. British Columbia and New York through United States, Mexico, and

Central America to Venezuela, Colombia, Ecuador, Peru, and Chile; also Bermuda and West Indies.

TEXAS: (See map.) *Resident:* Breeds, late Feb. to early Aug. (eggs, Mar. 3 to July 17; downy young to July 28) from near sea level to about 6,000 ft. Very common to fairly common virtually throughout, but often uncommon and local in northern Panhandle during coldest months.

HAUNTS AND HABITS: The Killdeer—that assertive plover with two breast-bands instead of the usual one or none—is the most numerous, widespread, clamorous, and, therefore, most conspicuous charadriid in Texas. It resides throughout the state from aridland mesas and canyons, dry uplands, grassy or bare plains and prairies, pastures, and cow lots to fields (cultivated or fallow), stream, river, and lake shores, irrigation ditches, and Gulf coast marsh, beach, bay, and lagoon flats. Airports, highway shoulders, golf courses, and large lawns are additional Killdeer foraging places; flat pebble rooftops as well as similar dry gravel beds of Texas rivers and creeks are much used for nest sites. In short, the Killdeer is both a water bird and a land bird which thrives in practically any open or semiopen habitat. This plover is generally seen singly or in small loose parties; however, where food is plentiful, a hundred or more birds may gather.

On the wing, the Killdeer is swift but erratic; it usually flies low and seldom for sustained periods. Like other plovers, adults and even chicks walk and run, often with astonishing speed. A full-grown individual stops at frequent intervals, raises its head high, and surveys the surroundings. It also hitches its head and tail in the teetering manner of many shorebirds. With quick abrupt jabs of its beak, the Killdeer picks up beetles, grasshoppers, ants, bugs, weevils, earth-





Killdeer, *Oxyechus vociferus*



American Golden Plover, *Pluvialis dominica*

worms, spiders, snails, and a few weed seeds; it frequently forages after dusk. Alert and noisy, its far-reaching outcries—often to the dismay of hunters—keep other birds informed of danger. Flushed from the nest, the Killdeer is an outstanding broken wing and crippled leg feigner.

A loud persistent *kill-deeah* (*til-dee* according to Texas Mexicans) is the namesake note of the Killdeer. Its early-warning call is a plaintive, somewhat drawn-out *tee-ee*; this becomes an emphatic *teeee!* if the bird is extremely frightened or startled at close range. As it flies away, the Killdeer sounds a rapid frantic *tee-tee-tee*, etc. In nuptial flight, the male gives a rather musical trill. All these notes, except the last, are heard throughout the year, especially when the Killdeer is agitated—which is practically always. The bird calls by sunlight, moonlight, and occasionally even by starlight.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN KILLDEER, *Oxyechus vociferus vociferus* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage (brown—normal—phase):* Acquired by partial prenuptial molt. Forehead and most of lores white; band on fore part of crown black; broad superciliary stripe white, as well as chin, throat, and nuchal collar; below this last, a narrow black collar; crown, occiput, and upper surface dull brownish olive gray; rump and upper tail-coverts bright ochraceous tawny, paler on latter; tail white at base, ochraceous tawny on middle portion, black subterminally and white terminally; middle tail feathers medially and terminally like back with subterminal zone of fuscous, outer feathers barred with fuscous; primaries fuscous black, inner webs white on basal portion, shafts white subterminally, inner primaries with large white spots on outer webs; secondaries fuscous, becoming mostly white on inner feathers; greater wing-coverts fuscous and broadly tipped with white; upper breast with band of white or buffy white, below this a black jugular band that is continuous with black nuchal band, and below this a second band of black; remainder of lower parts white. Bill black or slate black; inside of mouth light drab gray; tongue olive gray; naked eyelids orange vermilion or scarlet; iris vandyke brown; legs and feet buffy white, pale pinkish gray, pale grayish yellow, but joints olive buff, cream color, or dull brown; claws black. *Adults, nuptial (tawny phase):* Similar to brown phase, but upper parts, particularly back and wings, heavily tinged with tawny or russet; middle wing-coverts and some of lesser wing-coverts almost all of this color. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Essentially identical with nuptial adults. *First winter:* Acquired by partial postjuvinal molt and by wear from juvenal. Similar to juvenal, except for worn, somewhat faded condition of feathers. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts rather lighter, feathers with narrow buff or cinnamon tips; black of throat and jugulum duller. Bill black; eye-ring rufous; iris vandyke brown or seal brown; legs pale olive buff, pinkish buff, or ecru drab; toes pinkish buff or cream color, their joints cinereous; claws seal brown or black. *Natal:* Forehead white, fore part of crown and superciliary stripe black, continuous with a single black collar about hindneck and across jugulum; crown and occiput, with remainder of upper parts, brownish gray or drab, with black bar on each wing, black stripe on each side of rump, and interrupted black stripe in middle of lower back; all upper parts speckled and mixed with black and bister; crissum pinkish buff; remainder of lower parts white. Bill

dark gray; ring about eye lemon yellow; legs and feet light grayish flesh color.

MEASUREMENTS: *Adult male:* Wing, 153.9–167.1 (average, 160.3) mm.; tail, 87.9–103.1 (95.8); bill (exposed culmen), 19.0–23.1 (20.3); tarsus, 33.0–36.6 (34.8); middle toe without claw, 20.6–23.1 (21.9). *Adult female:* Wing, 147.1–169.9 (160.3); tail, 89.9–103.1 (94.7); bill, 19.6–22.1 (20.3); tarsus, 32.0–37.1 (35.3); middle toe, 20.6–22.1 (21.4).

RANGE: N.w. British Columbia and n. Manitoba to New Brunswick, south through United States to Baja California, Guerrero, and Tamaulipas; also Bahamas. Winters from s. British Columbia, Iowa, and New York through United States, Mexico, and Central America to Ecuador and n. Venezuela; also Bermuda and West Indies.

TEXAS: *Resident:* Collected north to Potter and Gray, east to Cooke, Trinity, and Jefferson, south to Cameron, west to Presidio and Hudspeth cos.

NESTING: *Nest:* In marshlands, meadows, pastures, creek valleys, borders of streams, dry gravel river beds, cultivated fields, gardens, ornamental grounds, or often far from water, even between ties of railroad tracks or on gravel roof; on high or low ground; often unprotected by vegetation or on bare rock, but sometimes in grass; usually composed of little nest material, such as a few bits of driftwood, stone, or even brick, weed stalks, weeds, grasses, or other vegetable matter. *Eggs:* 3–5, usually 4; ovate pyriform; without gloss; ivory yellow, cream buff, drab, or light clay color, with many streaks, spots, and blotches of dark brown or black, and shell markings of pale gray and dull lavender; average size, 36.3 × 26.7 mm.

AMERICAN GOLDEN PLOVER, *Pluvialis dominica* (Müller)

SPECIES ACCOUNT

Also known as Pacific Golden Plover; recently called Lesser Golden Plover. A rather large plover with fairly short, black bill; blackish legs. *Nuptial:* gold-flecked blackish above with white line across forehead, over eyes, and down sides of neck that terminates on sides of breast; black cheeks, under parts. *Winter:* brownish above; pale grayish buff below. Length, 10½ in.; wingspan, 22½; weight, 6½ oz.

RANGE: N. Siberia and n. Alaska to Banks and Devon islands, south to c. Siberia, s.w. Alaska, c. Mackenzie, n.e. Manitoba, and s. Baffin Island. Winters chiefly from s. Asia and Hawaiian Islands to Australia, Tasmania, New Zealand, and Tuamotu Islands, and in c. South America.

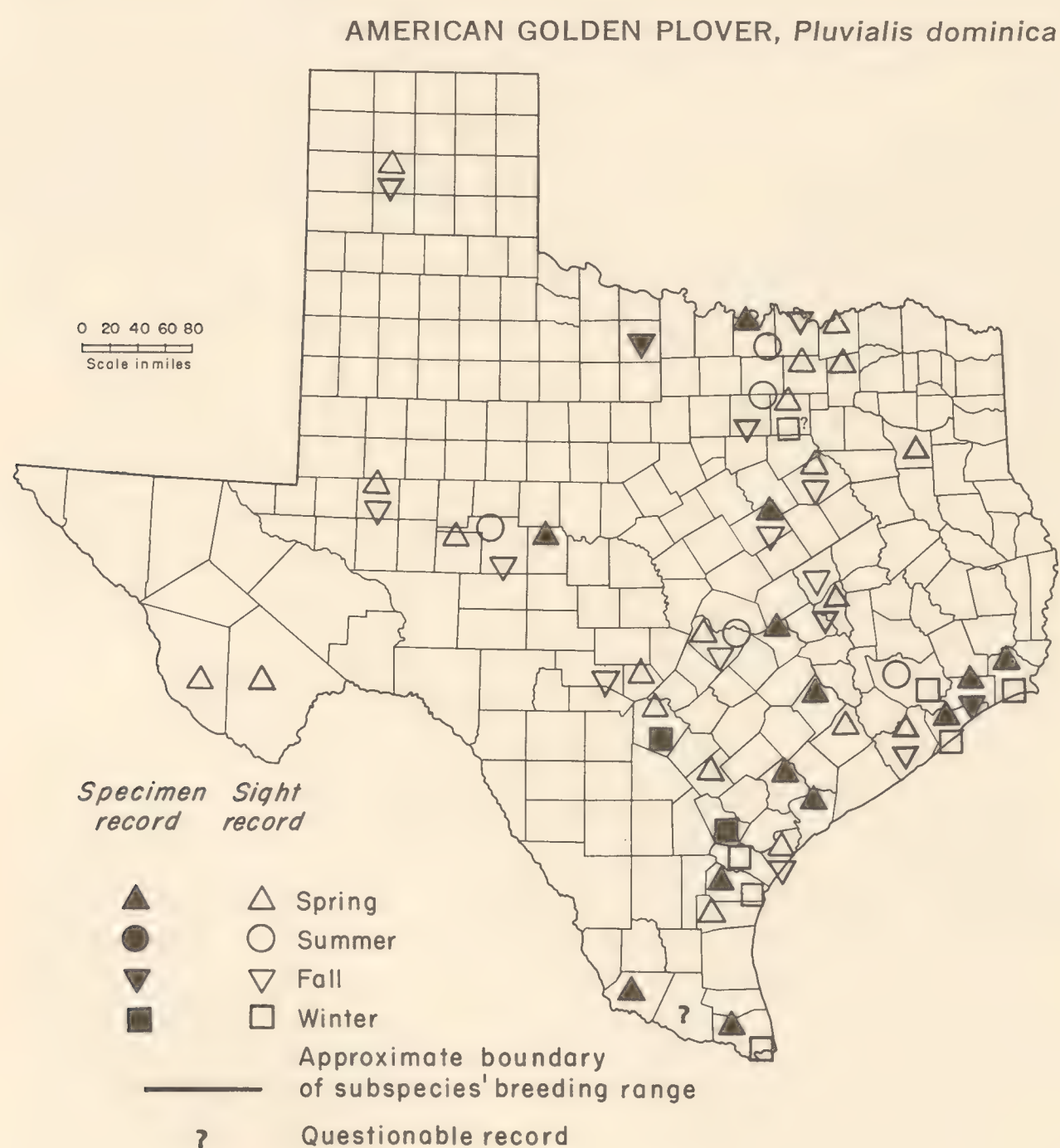
TEXAS: (See map.) *Migration:* Early Mar. to mid-May; early Aug. to late Nov. (extremes: Feb. 23, June 20; July 14, Dec. 26). Very common to fairly common in spring along coast; fairly common to scarce through much of interior eastern three-quarters; casual in Trans-Pecos. Uncommon to rare in fall through eastern three-quarters. *Winter:* One specimen: Bexar Co., San Antonio (Jan., year unknown, H. E. Dresser). Sightings: Galveston Co., Texas City Dike (seen on at least 3 occasions between Dec. 14, 1970, and Jan. 26, 1971, Frances Hames, D. H. Hardy, Linda Snyder, et al.); San Patricio Co., Welder Wildlife Refuge (injured bird seen, Dec. 9, 1955, fide Clarence Cottam).

HAUNTS AND HABITS: During spring, compact flocks of American Golden Plovers fly chiefly across the U.S.

Great Plains enroute to coasts and barrens of the Arctic. Texas transients—some in rich, gold-spangled, dark nuptial dress, but most still in winter plumage—seek short grass of rolling prairies, plains, pastures (especially if recently burned over), golf courses, and airports; exceptionally, they land on sandy or muddy flats of the Gulf coast or the shores of large bodies of water in the interior. On the nesting grounds, a pair constructs its shallow nest hollow on open tundra usually on reindeer moss. In fall, migrants move chiefly over the Pacific and Atlantic to their wintering grounds; those few that occur inland are generally young birds, which are more prone to visit muddy shores than are their elders.

On long pointed wings, flight of this long-distance traveler is strong and swift; Golden Plovers have been clocked at over 70 m.p.h. Migrating parties move high in the sky, but foraging groups generally skim low over the land. Often a flock performs extensive mid-air evolutions prior to alighting; once on the ground, the birds immediately disperse to feed. The Golden Plover runs swiftly about as it searches for its favored insect food—crickets, locusts, grasshoppers, others; in summer, birds also fatten up on crowberries and other wild arctic fruits. Typical of plovers, a foraging Golden repeatedly walks or runs a few steps, then halts abruptly, assumes an erect posture, and peers about on the alert for both prey and danger; a frightened individual almost invariably sounds an alarm note.

The common call of the American Golden Plover, most often given in flight, is a quavering *que-e-e-a*, which descends in pitch; short and long variations of this are *que* and *quee-del-ee*. This species vocalizes less in Texas than does its grassland associate, the Upland Plover.



DETAILED ACCOUNT: ONE SUBSPECIES

ATLANTIC AMERICAN GOLDEN PLOVER, *Pluvialis dominica dominica* (Müller)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Narrow line across forehead dull black; forehead and broad superciliary stripe and sides of neck white; remainder of upper surface fuscous black, thickly spotted with golden yellow and slightly with dull white, these markings on upper tail-coverts more in form of bars and more or less concealed on pileum and upper hindneck; tail fuscous, with numerous bars of hair brown becoming whitish on outer feathers; wing-quills fuscous, inner webs lighter, becoming whitish basally; shafts of primaries subterminally white; secondaries and most of wing-coverts hair brown edged with paler; inner coverts like back; lores, sides of head below eyes, and entire lower parts black, sides of body with a few bars of white and golden yellow, and longer lower tail-coverts barred with white; lining of wing light hair brown or drab, slightly mottled with darker. Bill black; iris vandyke brown, prout brown, or bluish black; legs and feet slate gray or black. *Adults, winter:* Acquired by complete postnuptial molt. Sides of head and lower surface without black; forehead and superciliary stripe pale grayish or brownish white, streaked with drab or hair brown; top of head fuscous, streaked with dull white and yellowish buff; upper parts similar to nuptial adults, but neck drab gray and spots on mantle mostly dull white; sides of head and of neck, throat, jugulum, and upper breast dull light drab, the drab marked with whitish; chin, lower breast, and remainder of lower surface white, sides, flanks, and crissum somewhat spotted with drab. *First nuptial:* Acquired by nearly complete prenuptial molt. Similar to nuptial adults, but usually with some retained feathers of first winter. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but differs in retention of tail and some wing feathers and scapulars from juvenal. Bill black; tongue smoke gray; iris black; legs smoke gray; toes mouse gray; claws black. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but spots on upper surface, particularly on pileum, as yellow as in nuptial adults, or even more so; lower parts more tinged with yellow or brown; sides of neck, cheeks, ear-coverts, and stripe through eye streaked with dull brown; abdomen suffused with pale brown, sometimes barred with darker brown; flanks light grayish brown or brownish white, tipped and barred with darker brown, barred also with buff or dull white. Bill black; iris vandyke brown; legs and feet slate gray; claws black.

MEASUREMENTS: *Adult male:* Wing, 166.6–183.6 (average, 178.3) mm.; tail, 59.9–74.9 (67.8); bill (exposed culmen), 20.6–23.9 (22.4); tarsus, 38.6–45.0 (41.7); middle toe without claw, 21.1–24.4 (22.9). *Adult female:* Wing, 168.9–186.2 (179.1); tail, 57.9–70.1 (65.3); bill, 22.1–23.6 (22.6); tarsus, 40.4–44.4 (42.9); middle toe, 23.1–24.9 (23.6).

RANGE: N. Alaska (Point Barrow) to Banks and Devon islands, south to c. western Alaska (north of Norton Sound), c. Mackenzie, n.e. Manitoba, and s. Baffin Island. Winters chiefly from Bolivia, Paraguay, and s. Brazil to c. Argentina and Uruguay.

TEXAS: *Migration:* Collected north to Cooke, east to Jefferson, south to Cameron, west to Starr, Concho, and Archer cos. *Winter:* One specimen (see species account).

BLACK-BELLIED PLOVER, *Squatarola squatarola* (Linnaeus)

SPECIES ACCOUNT

Grey Plover of British authors. A large plump plover which resembles the somewhat smaller American Golden Plover, but has bigger head; longer, heavier bill. In flight, reveals white wing-stripe and base of tail;

finely black-barred whitish tail; black axillar-patch. *Nuptial*: whitish-speckled (not gold-flecked) blackish above with whitish crown; black of under parts terminates on belly, leaving white crissum. *Winter*: grayish (not brownish) above; largely whitish (not grayish buff) below. Length, $11\frac{3}{4}$ in.; wingspan, $24\frac{1}{2}$; weight, $8\frac{1}{2}$ oz.

RANGE: N.w. Russia and n. Siberia (including Kolguyev, Novaya Zemlya, New Siberian, and Wrangel islands, and Gulf of Anadyr) to w. and n. Alaska, n. Mackenzie, and Banks, Somerset, and Devon islands, south to Melville Peninsula and s.w. Baffin Island. Almost cosmopolitan in winter, mainly on coasts between lat. 60° N. and 45° S.

TEXAS: (See map.) *Migration*: Mid-Mar. to late May; mid-July to mid-Nov. (extremes: Mar. 5, June 18; June 25, Dec. 4). Very common to fairly common along coast; fairly common locally to scarce through much of interior eastern three-quarters; rare in fall through El Paso region. *Winter*: Late Dec. to late Feb. Common to uncommon along coast. One inland specimen: Archer Co. (Jan. 6, 1959, W. W. Dalquest; Midwestern University collection, no. 18046).

HAUNTS AND HABITS: Largest of the North American-nesting Charadriidae, the Black-bellied Plover is a powerful flier whose swift wing-strokes reveal glimpses of its diagnostic black axillar-patch. Somewhat rounder headed, larger, and stockier than the American Golden Plover, its terrestrial mannerisms appear very dignified. The species breeds widely in the Arctic; pairs select, if possible, a prominent river bluff on rolling upland tundra for their moss-lined nest hollow. Most migrants haunt coastal beaches and salt marshes, but those that transit inland appear on lake or pond shores,

mud flats, and moist meadows and pastures. Only very occasionally is *Squatarola squatarola* seen in dry short grass, the favorite habitat of the Golden Plover. Black-belly flocks, though of considerable size at times, are not as large as some shorebird gatherings. Migrants in small parties rest and feed most commonly with Ruddy Turnstones, Willets, Knots, and Sanderlings. In the fall they even associate with Golden Plovers.

When flying from place to place about the breeding or feeding areas, Black-bellied Plovers, usually in straggling lines, pass rapidly and buoyantly over the water or ground; however, migrants move high in the sky, sometimes in rather orderly groups like ducks. A foraging bird moves quickly—kicking feet well out in front as it strides along flats; when it stops, it strikes the same alert attitude that is characteristic of the Golden and other plovers. Seashore food is primarily marine worms and insects, small mollusks and crustaceans; on inland meadows and pastures, grasshoppers, locusts, grubs, beetles, earthworms, seeds, and berries are eaten.

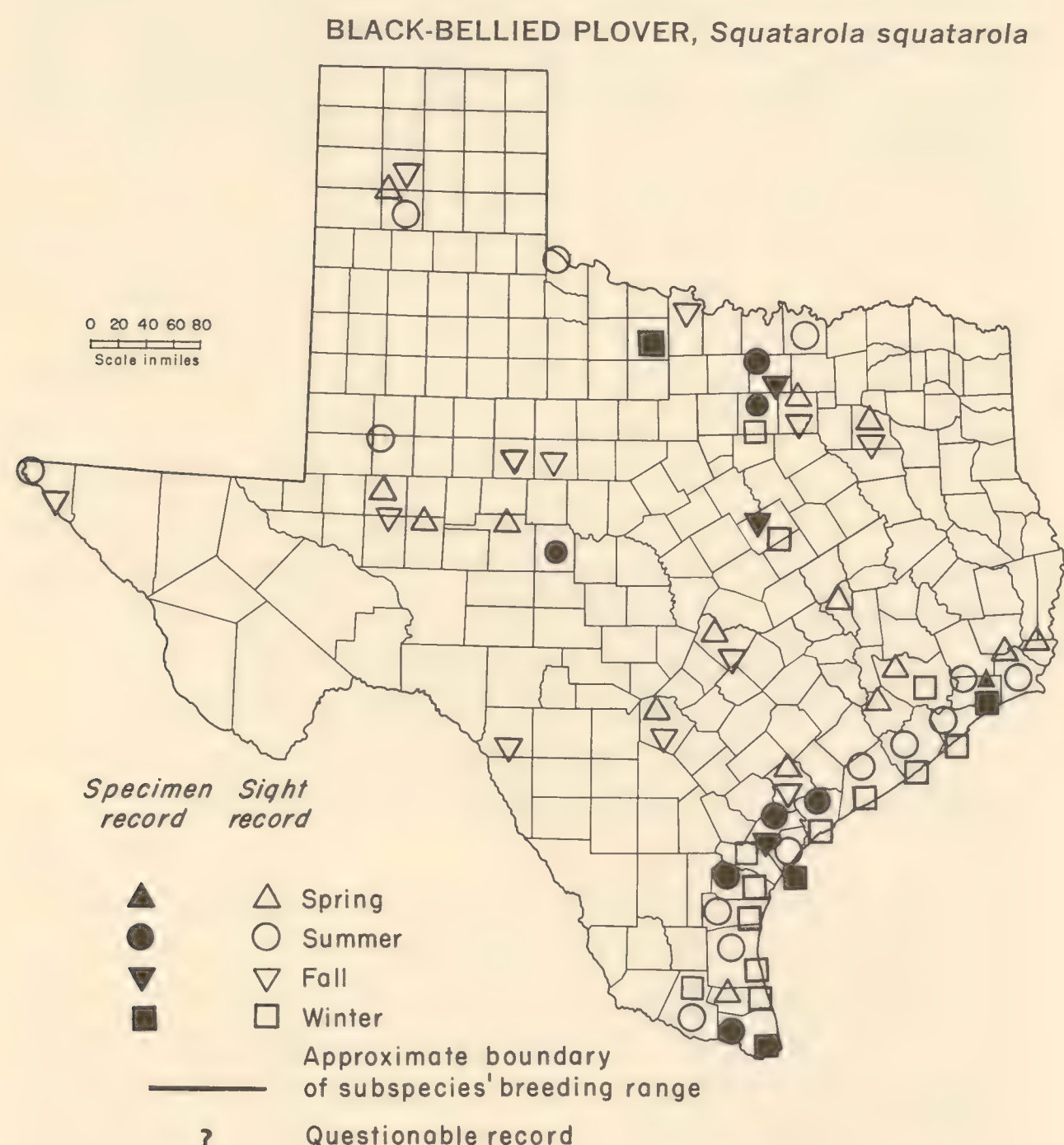
The flight whistle of the Black-bellied Plover, sweet and plaintive, is a slurred *tlee-u-eee* or *whee-er-eee* (middle note lowest).

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN BLACK-BELLIED PLOVER, *Squatarola squatarola* (Linnaeus)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Pileum and sides of neck white; middle part of crown and of occiput, together with hindneck, white, feathers with central spots of chaetura black; back, scapulars, and rump chaetura black or dull black with large spots and tips of white; upper tail-coverts white, slightly tipped with chaetura drab or chaetura black; tail white, narrowly and sometimes irregularly barred with dull black or fuscous, primaries fuscous or fuscous black, shafts white on middle portions, inner webs white on basal portions, and inner primaries white on middle portion of outer webs; secondaries hair brown, inner webs largely white except at tips; lores, sides of head below eyes, and most of lower parts dull black or fuscous black; abdomen and crissum white; longest lower tail-coverts with a few spots of fuscous or dull black; lining of wing white; axillars fuscous black to brownish black. Bill black; inside of mouth orange; iris mummy brown to bluish black; legs and feet dull black, slate black, blackish slate, or slate color. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but feathers of upper surface and upper wing-coverts with narrow white tips; black of under surface more brownish, somewhat mixed with white; lower tail-coverts white, somewhat mixed with brown. *Adult male and female, winter*: Acquired by complete postnuptial molt. Crown fuscous black, mixed with white and fuscous; remainder of upper parts fuscous or hair brown, spotted and mottled with white, otherwise like nuptial adults; sides of head, with lower parts, entirely white, jugulum spotted or streaked with drab; sides of neck mostly hair brown mixed with white. *Male and female, second winter*: Acquired by complete postnuptial molt. Like adults in winter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, except for many dull feathers retained from first winter. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to first nuptial male, but upper parts with more retained winter plumage; breast with less black. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to adults in winter,



but retained juvenal wing-coverts have creamy white or yellowish tips and partial bars; rump has some pale yellow spots; some worn tertials and scapulars are retained from juvenal. Bill black; inside of mouth and tongue deep gull gray; iris prout brown or black; legs and feet dark gull gray; claws black. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but upper parts thickly spotted with light yellowish buff, this also tinging tip of tail; lower surface somewhat washed with isabella color except on abdomen and crissum. Bill olivaceous black; legs and feet greenish slate or bluish slate.

MEASUREMENTS: *Adult male*: Wing, 182.1–198.7 (average, 189.7) mm.; tail, 71.9–81.5 (75.9); bill (exposed culmen), 43.4–53.1 (48.0); middle toe without claw, 24.9–29.4 (27.2). *Adult female*: Wing, 181.1–191.0 (186.7); tail, 69.6–83.1

(73.2); bill, 26.9–33.0 (30.2); tarsus, 41.9–49.5 (46.3); middle toe, 24.9–28.4 (26.7).

RANGE: From Kanin Peninsula in n. Russia to Taymyr Peninsula in n. Siberia; and from n. Alaska, n. Mackenzie, and Banks, Somerset, and Devon islands, south to Melville Peninsula and s.w. Baffin Island. Winters widely, mainly on coasts, in both Old and New World; in Western Hemisphere, locally from s. British Columbia and Baja California to Ecuador (including Galápagos Islands) and n. Chile, and from Massachusetts (rarely), Florida, and Texas to Caribbean slope and s. Brazil.

TEXAS: *Migration*: Collected north to Denton, east to Chambers, south to Cameron, west to Concho (Aug. 31) cos. *Winter*: Taken along coast in Chambers, Aransas, and Cameron cos. One inland specimen (see species account).

[Surfbird: Aphrizidae

SURFBIRD, *Aphriza virgata* (Gmelin)

A plump, turnstone-sized shorebird; has short blackish bill with yellowish at base of mandible; greenish or yellowish legs. In flight, shows narrow white wing-stripe; white tail with wedge-shaped black tip. *Spring adult*: gray- and buff-tipped black above; white below, heavily spotted with blackish chevrons. *Fall adult*: uniformly slaty above and on breast; remaining lower

parts white with a few blackish flecks on sides and flanks. Length, 10 in.; wingspan, 17; weight, 5 oz.

RANGE: Mountains of s. central Alaska. Winters coastally from s.e. Alaska, Baja California, and Panama to Strait of Magellan.

TEXAS: *Hypothetical*: One careful sighting: Nueces Co., jetties at Port Aransas (1 from Apr. 1 to 12, 1951, C. D. Brown, J. L. Edwards, Connie Hagar, F. G. Watson, et al.; substantiated by rather poor photographs).]

Turnstones: Arenariidae

RUDDY TURNSTONE, *Arenaria interpres* (Linnaeus)

SPECIES ACCOUNT

Turnstone of Old World authors. A rather small, squat shorebird with short pointed blackish bill, straight or slightly upturned; orange-red legs; in flight, reveals striking black-and-white-pied pattern on fore-quarters and wings. *Nuptial*: largely cinnamon above with blackish-streaked white crown; white below with black breast-shield that extends in lines onto white face to form distinctive harlequin mask. *Winter*: dark brownish above; white below with blackish breast-patch. Length, 9½ in.; wingspan, 19; weight, 4 oz.

RANGE: Arctic, south to c. western Alaska, Baffin Island, isles in Baltic Sea, and Bering coast of Siberia. Winters mainly coastally, chiefly between lat. 60° N. and 45° S.

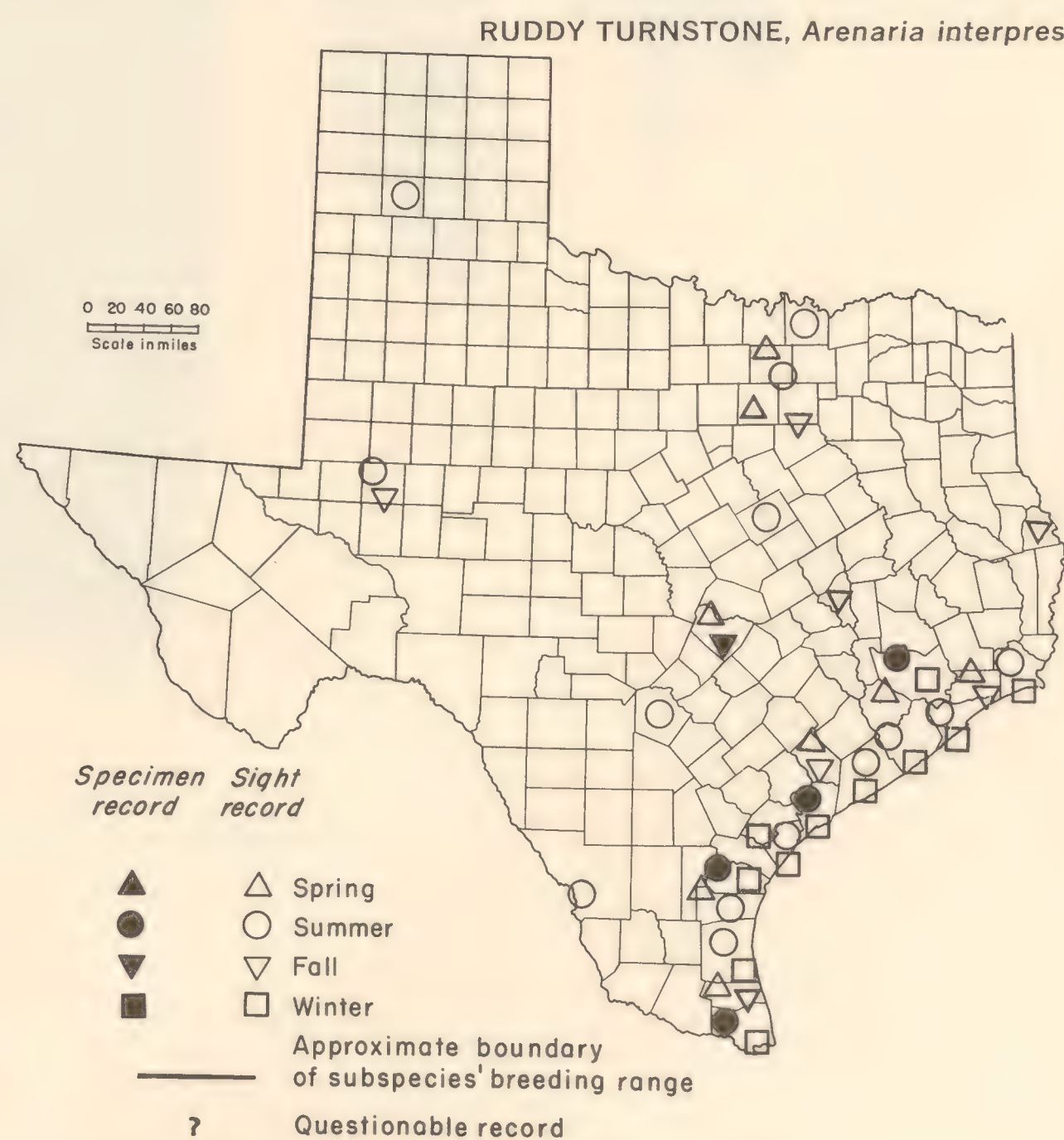
TEXAS: (See map.) *Migration*: Late Mar. to late May; early Aug. to early Oct.—mid-Nov. along coast (extremes: Feb. 19, June 21; July, Dec. 17). Common to fairly common along coast; scarce (mainly in fall) to rare through interior central regions, chiefly between 96th and 99th meridians; rare in fall west to Randall, Midland, and Webb cos.; one record from extreme east Texas: Sabine Co. (Sept. 10, 1972, C. D. Fisher, David Wolf). Nonbreeding stragglers frequent along coast in mid-summer. *Winter*: Late Nov. to Mar. Fairly common to uncommon along coast.

HAUNTS AND HABITS: The harlequin-feathered Ruddy Turnstone is a robust ploverlike bird which skitters on sandy beaches, tidal flats, and jetties. Of the two species of turnstones, it is by far the more numerous and widespread. In New Zealand and Hawaii, the Ruddy often flocks with Golden Plovers in grassy inland pastures, but in most other places this turnstone is almost entirely a seaside bird. On California shores, it feeds a bit on Pacific-splashed boulders, but mostly leaves these to the rock-loving Black Turnstone. Texas beaches furnish an abundance of prime habitat for the Ruddy—sand and seashells.

This cosmopolitan species breeds on arctic islands and coasts. Often on a ridge or river bluff, a pair incubates the four-egg clutch in a moss-lined hollow on the open ground or tundra moss. Migrants in Texas move chiefly coastally; a very few are found inland about shores of lakes or ponds. It travels in large flocks,

often with other shorebirds, particularly the Black-bellied Plover. Wintering birds in the Lone Star State live on or near Gulf of Mexico beaches and to a lesser extent on salt bay shores. Like the Sanderling, the Ruddy often summers thousands of miles south of its breeding range; however, the turnstone, at least in Texas, is considerably less numerous than *Crocethia alba*, thus reducing somewhat the wonderment at how this species maintains its numbers. When feeding and resting, birds disperse in small loose bands.

Flight of the Ruddy is swift and powerful with moderately rapid wing-beats. It flies high during migration, but junkets about the feeding or breeding areas are usually low to the ground or water. In its busy searches for seashore animal matter, the Ruddy upends stones (when on stony beaches) and shells with its short stout pointed bill. It also roots in sand or seaweed—often making fist-size depressions—to uncover small crabs, shrimp, sand fleas, worms, marine mollusks, crustaceans, and insects. When overturning large obstacles, it heaves and shoves with its breast. A pugnacious defender of its small feeding plot, it charges, with wings



lowered and back hunched, at other Ruddies or small shorebirds which intrude in its territory. The bird swims well on the water's surface.

In flight or when flushed, on or off the breeding area, Ruddy Turnstones sound staccato notes rendered variously as *tuk-a-tuk*, *kut-a-kut*, or *cut-i-cut*; also a single *kewk*.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN RUDDY TURNSTONE, *Arenaria interpres morinella* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead, lores, and sides and back of pileum white; nearly vertical black bar underneath eye, extending to cheeks; middle of crown fuscous black, streaked with pale buff or dull white; black collar on hindneck below white of occiput but interrupted in middle behind; below black collar a broad collar of white; back and scapulars glossy olive greenish black mixed with cinnamon rufous, this on tertials taking form of irregular broad bars; rump white; short upper tail-coverts fuscous black; longest upper tail-coverts white, middle ones sometimes slightly spotted with dull black; tail white, terminal portion of remainder of feathers, except tips, fuscous black, amount diminishing on outer feathers; primaries fuscous, darker terminally but paler on basal portion of inner webs where becoming almost white, subterminal portion of shafts also white; inner primaries with basal portion of outer webs white; outer secondaries hair brown; inner secondaries chiefly white; lesser wing-coverts mostly fuscous, edged with brownish white or white and some of them rather extensively cinnamon rufous, middle coverts and greater coverts hair brown, the latter broadly tipped with white; a black malar stripe joining black bar underneath eye, these continuous with black collar on hindneck and black lower throat and sides of breast; chin, middle of upper throat, middle of jugulum, lower breast, and remainder of lower parts white; lining of wing white. Bill black or chaetura black, but base sometimes chaetura drab; eyelid and tongue blue-black; iris hazel, auburn, vandyke brown, or black; legs and feet deep orange-red, orange vermillion, or scarlet, but joints burnt sienna; claws black. *Adult female, nup-*

tial: Acquired by partial prenuptial molt. Similar to nuptial adult male, but upper parts much duller, white of head and neck much mixed with pale buff or brown; remainder of upper surface more clouded, feathers of dark areas tipped with pale brown and with more or less cinnamon rufous admixture in plumage. Bill blue-black to bone brown; tongue white, gray at tip; gape light orange; iris chestnut to black; legs and feet grenadine red or orange; claws black. *Adult male and female, winter:* Acquired by complete postnuptial molt. Resembling nuptial adult female, but black-and-white pattern of head broken by dull white or pale brown; upper surface with little, if any, rufous, mostly fuscous or fuscous black with light brownish gray or dull white edgings; black of sides of neck and jugulum much mixed with dull white or pale brown. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but head most noticeably streaked with black or dark brown; new plumage of back, scapulars, and wing-coverts mixed with old feathers. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to first nuptial male but coloration duller. *Male and female, first winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but head, neck, and back with more buff and dull white streaking, and, therefore, lighter; some scapulars, tertials, and wing-coverts retained from juvenal; jugulum and breast with less black. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but upper parts more buffy, back, scapulars, and tertials conspicuously margined with buffy white, pale buff, or cinnamon, and tail tipped, at least on middle feathers, with cinnamon buff.

MEASUREMENTS: *Adult male:* Wing, 139.4–154.9 (average, 145.5) mm.; tail, 56.4–64.0 (59.9); bill (exposed culmen), 21.1–22.6 (21.9); tarsus, 22.6–25.9 (24.4); middle toe without claw, 21.1–23.1 (21.9). *Adult female:* Wing, 144.0–157.5 (148.9); tail, 56.9–63.0 (60.2); bill, 21.6–23.9 (22.9); tarsus, 23.1–25.4 (24.4); middle toe, 20.6–23.9 (22.1).

RANGE: N. Alaska and Melville Island to n.w. Greenland, south to Yukon delta in Alaska and s.w. Baffin Island. Stragglers found widely during summer in both Americas. Winters coastally from s. California, Mexico, and Central America to Ecuador (including Galápagos Islands) and Chile, and from North Carolina, Florida, Texas, Yucatán, and Central America to s. Brazil; also West Indies.

TEXAS: *Migration:* Collected along coast northeast to Harris (June 9), southwest to Cameron cos.; inland in Travis Co. *Winter:* See species account.



PLATE 11: Long-eared Owl, *Asio otus*

Sandpipers: Calidrididae

AMERICAN WOODCOCK, *Rubicola minor* (Gmelin)

SPECIES ACCOUNT

Philohela minor of A.O.U. check-list, 1957 (see Appendix A). A largely nocturnal, medium-sized, chunky, short-necked, decidedly atypical sandpiper with large brown eyes; very long, straight ($2\frac{1}{4}$ –3 in.) brownish bill; rounded wings; flesh-colored legs. *Nuptial*: black-, gray-, and buff-mottled brown above (suggests dead leaves) with three broad blackish bars on crown; largely cinnamon below. *Winter*: similar but coloration richer. Eyes shine startlingly reddish by auto lights (R. S. Palmer). Length, 11 in.; wingspan, $16\frac{3}{4}$; weight, $6\frac{1}{2}$ oz.

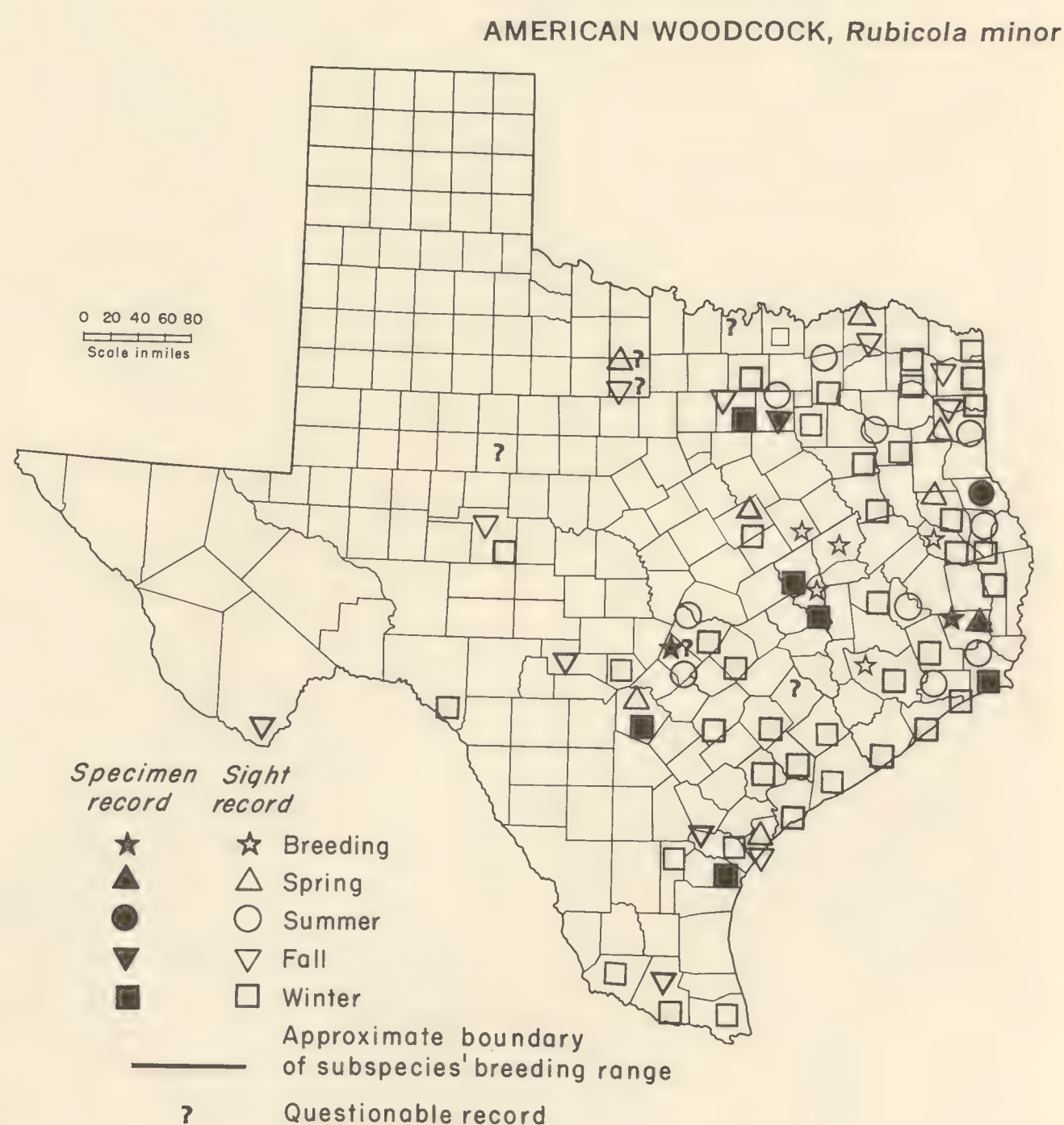
RANGE: N.e. North Dakota to Nova Scotia, south to e. Texas (rare) and c. Florida. Winters from e. Oklahoma and Virginia to e. Texas and s. Florida.

TEXAS: (See map.) *Breeding*: Early Jan. to mid-Apr. (eggs, Jan. 28 to about Mar. 17) from near sea level to about 600 ft. Rare and local in wooded eastern quarter; nests (apparently authentic) located west to Limestone, Leon, Brazos, and Harris (nest with broken eggshell discovered near Fauna, Mar. 17, 1926, J. J. Carroll) cos. One Edwards Plateau record: Hays Co. (eggs collected, Jan. 28, 1888, G. B. Benners). *Winter*: Mid-Oct. to mid-Feb. (extremes: June 26, May 17). Fairly common to uncommon in much of eastern portion west to Lamar, Hunt, Henderson, Anderson, Robertson, Brazos, Bastrop, Gonzales, and Matagorda cos.; uncommon to scarce on central coast; scarce to rare in remainder of eastern half, including Rio Grande delta; increasingly rare west to Nolan, Tom Green, and Val Verde cos.; casual at Big Bend Nat. Park (1 at Rio Grande Village on Nov. 2, 1965, Coleman Newman, Dan Beard, fide R. H. Wauer).

HAUNTS AND HABITS: In habitat and behavior the American and Eurasian woodcocks are definitely extraordinary among the world's seventy-seven Calidrididae (Scolopacidae). Most are diurnal, gregarious birds of seashore, mud flat, or upland prairie. *Rubicola minor*, an orthodox woodcock, shuns daylight, its fellows, and wide open spaces. Prime haunts are muddy or moist ground of thickets (especially alder) skirting banks of winding streams, rich willow-maple-sumac bottomlands, and the floor of second-growth woods that sprout up on abandoned farm lands. In fact, in southeastern

Canada and eastern United States, almost any shadowy, secluded place with moist, earthwormy soil is potential woodcock habitat. Much of the eastern third of Texas appears acceptable for the present species and it is often said to breed widely in this area, but specific evidence of nesting is remarkably sparse. Thus, it is chiefly as a migrant and winter resident that *R. minor* has firm claim to Texas citizenship. Quite unsociable, birds, even during their night migrations, appear to move separately: The senior editor recalls watching a lone spring migrant at dusk flying north through New York City's Central Park.

On these nocturnal flights to and from the wintering grounds, the American Woodcock generally flies swiftly and low; individuals are frequently killed when they strike buildings or utility wires. Flight of a just-flushed bird is weak and irregular. The bird gains speed and direction when it clears dense vegetation, but usually after a short distance drops to cover again. This woodcock looks and behaves much like a Bobwhite when flushing. At this time its fantastically long bill is an es-





Common Snipe, *Capella gallinago*

stantial field mark! Having rested all day in damp thickets, it becomes active at dusk. This chunky-bodied bird with bill held downward is an unforgettable sight in hazy twilight as it moves steadily across treetops and open spaces enroute to the feeding grounds.

Expert at probing for earthworms with its very flexible bill, *R. minor* often snatches its prey on the first try. Several theories pertain to this ability: The presence of a worm rooting in the soil apparently is determined either by the keenly sensitive bill, an acute sense of hearing, feeling in the feet, or a combination of these senses; it is also possible that as the bird patters about on the damp ground it coaxes worms to the surface much as do raindrops. Usually when absence of rain makes earthworming difficult, it eats grubs, slugs, ants (chiefly in spring), insects and their larvae. The woodcock's large eyes are amazingly far back on the sides of the head. It has long been speculated that this adaptation allows the bird to see enemies approaching from the sides or even from behind when its bill and face are buried in mud.

Male and female of this promiscuous species maintain separate territories. In addition to the damp, secluded feeding patch, a flat open place grown to weeds and grass is requisite for the area where the male goes to perform his nuptial flight song; the female's territory usually is in more open tracts of small trees close to her moist-ground foraging area.

The American Woodcock for the most part is a quiet bird, but it makes interesting sounds in the breeding season. At dusk or in moonlight in early spring, the male flies to a cleared place he has staked out. Here, while standing, walking, or strutting, he sounds a harsh, explosive, buzzy, nighthawklike *peent* or *beezp*; this is preceded by a faint cooing *took-oo*, which is sometimes given separately. After the ground display, he often flies up to a height of 250 feet, all the while sounding liquid twitterings (which may be made, at least in part, by the bird's narrow outer primaries). Suddenly he zigzags back down, bubbling clear chipping notes, to his ground station. This exhibition attracts the female to the display ground where mating takes place. He also rasps out a *cac-cac-cac* when he is defending his territory. The female utters a wheezy note from the ground. Both sexes can produce mechanical twitters in flight with their slotted outer primaries.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (gray phase):* Acquired by partial prenuptial molt. Forehead and hindneck light brownish neutral gray, center of forehead and middle of nape more or less marked with dull black; dark brown line from bill through eye; occiput dull black or fuscous black with bars of dull cinnamon buff; back and scapulars hair brown, heavily spotted with black, and tipped and spotted with whitish, pale buff, and dull cinnamon buff, also with large spots of light brownish neutral gray; rump fuscous black, tipped with cinnamon and pale dull buff; upper tail-coverts similar, and laterally almost wholly cinnamon rufous or dull cinnamon; tail fuscous black, outer webs finely spotted with pale buff or dull cinnamon and broadly tipped with light brownish neutral gray; wings hair brown, quills darker, their tips and outer webs of secondaries with

mottlings of brownish white and dull buff; lesser wing-coverts anteriorly fuscous and all much mottled and tipped with cinnamon and pale buff; chin white; throat dull light brownish neutral gray washed with cinnamon; remainder of lower parts cinnamon buff deepening to cinnamon rufous posteriorly; lining of wing dull cinnamon. Tip of bill seal brown; base of maxilla light drab; base of mandible fawn color or somewhat yellowish; middle of bill light brown; tongue and inside of mouth vinaceous pink; iris prout brown; legs and feet vinaceous buff, light brownish flesh color, or pinkish flesh color. *Adults, nuptial (rufous phase):* Similar to gray phase, but upper parts much more tinged with rufous throughout, bars on hindneck, back, scapulars, and other parts of upper surface cinnamon rufous; lower surface, except for buffy white chin, almost uniform dull cinnamon rufous; sides and flanks dull hazel, thus much darker and more uniformly rufescent than under parts in gray phase. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults but more deeply and brightly colored. *First nuptial:* Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to first nuptial, except for some retained juvenal feathers. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but edges of scapulars, tertials, and wing-coverts broader; tertials, scapulars, back, and median wing-coverts with less black on feathers, their black bars less heavy and less regular; upper wing-coverts mottled, not barred; texture of general plumage not so firm. Bill blackish slate, but tip slate black, rest of mandible pinkish slate; inside of mouth and tongue dull white; iris prout brown. *Natal:* Upper surface dull light pinkish cinnamon; broad stripe in middle of crown, loreal streak, streak on side of head, postocular streak, and patch on nape dark chestnut brown or dark brownish umber; upper parts with large patches of same color; lower parts ochraceous buff or cinnamon.

MEASUREMENTS: *Adult male:* Wing, 118.6–128.0 (average, 123.5) mm.; tail, 54.1–63.0 (59.7); bill (exposed culmen), 59.9–67.6 (64.0); tarsus, 29.4–33.0 (31.2); middle toe, 28.9–32.5 (30.5). *Adult female:* Wing, 129.0–143.0 (134.7); tail, 57.9–65.0 (61.5); bill, 64.0–74.9 (71.7); tarsus, 32.0–36.1 (33.3); middle toe, 31.0–36.1 (33.0).

TEXAS: *Breeding:* Two specimens: Hardin Co., 7 mi. northeast of Sour Lake (both small young, Mar. 22, 1905, J. H. Gaut). (See species account.) *Winter:* Taken north to Tarrant and Dallas (Nov. 25), east to Jefferson, south to Nueces, west to Bexar cos.

NESTING: *Nest:* In damp thickets, bushy meadows, wet lowlands, dry ground in open pastures, or margins of woodlands; in thickets, other underbrush, tall weeds, at base of bush or tussock, or even by log or stump; in slight hollow in ground, eggs laid on fallen leaves or sometimes dry grass, with little or no effort at nest construction. *Eggs:* 3–5, usually 4; extraordinarily 12 (no doubt by more than one female); ovate or rounded ovate; somewhat glossy; cream buff, pinkish buff, light clay color, pale gray, or buffy brown; mottled and spotted with different shades of brown, with shell markings of vinaceous drab or brownish drab, all these markings sometimes chiefly about larger end; average size, 38.1 × 28.9 mm.

COMMON SNIPE, *Capella gallinago* (Linnaeus)

SPECIES ACCOUNT

American birds also known as Wilson's Snipe. A medium-sized, Dowitcher-shaped sandpiper with a very long (2¼–3 in.), straight, black-tipped brownish bill; rather short, pale gray-green legs. In zigzag flushing flight, shows long pointed wings; brown rump; and short black tail with broad subterminal cinnamon bar. *Nuptial:* heavily buffy-striped brownish black above;

largely white below with brown-streaked buffy breast. *Winter*: similar but coloration richer. Length, 10¾ in.; wingspan, 17; weight, 4 oz.

RANGE: N. Alaska, n. Quebec, British Isles, n. Europe, and Asia, south to California, c. New England, s. Europe, Himalaya Mts., and Kurile Islands. Winters chiefly between lat. 60° N. and Tropic of Capricorn.

TEXAS: (See map.) *Winter*: Early Sept. to late Apr. (extremes: July 13, June 22). Very common to fairly common in most parts; normally uncommon in Panhandle and in especially arid sections.

HAUNTS AND HABITS: The Common Snipe is a widespread but usually solitary, reclusive, and therefore infrequently observed sandpiper. Plumage that is colored and patterned after the bird's marsh and bog haunts permits it to sit tight in times of danger long after most other birds would have flushed. In spring, these snipe return early to the barely thawed nesting areas in North America and Eurasia. In a *Sphagnum* bog (farther south on its breeding range, in a grass, sedge, or cattail marsh), individuals construct a grass-lined nest, usually under a canopy of grass stalks, on a sedge tussock or fern clump. Transients and wintering birds in Texas retreat to shallow rain pools—even water-filled or muddy hoofprints of cattle—in prairies and pastures, also mowed or plowed fields, fresh or salt marshes, roadside drainage ditches, densely vegetated springs, and like muddy situations. Migrants apparently move at night in small flocks—the extent of the species' gregariousness—but during the day birds separate to feed and rest.

Flight during migration is swift, strong, and high in the sky; a flushing snipe, however, characteristically bursts out of hiding in erratic, zigzag flight. Frightened individuals have been known to dive and swim under-

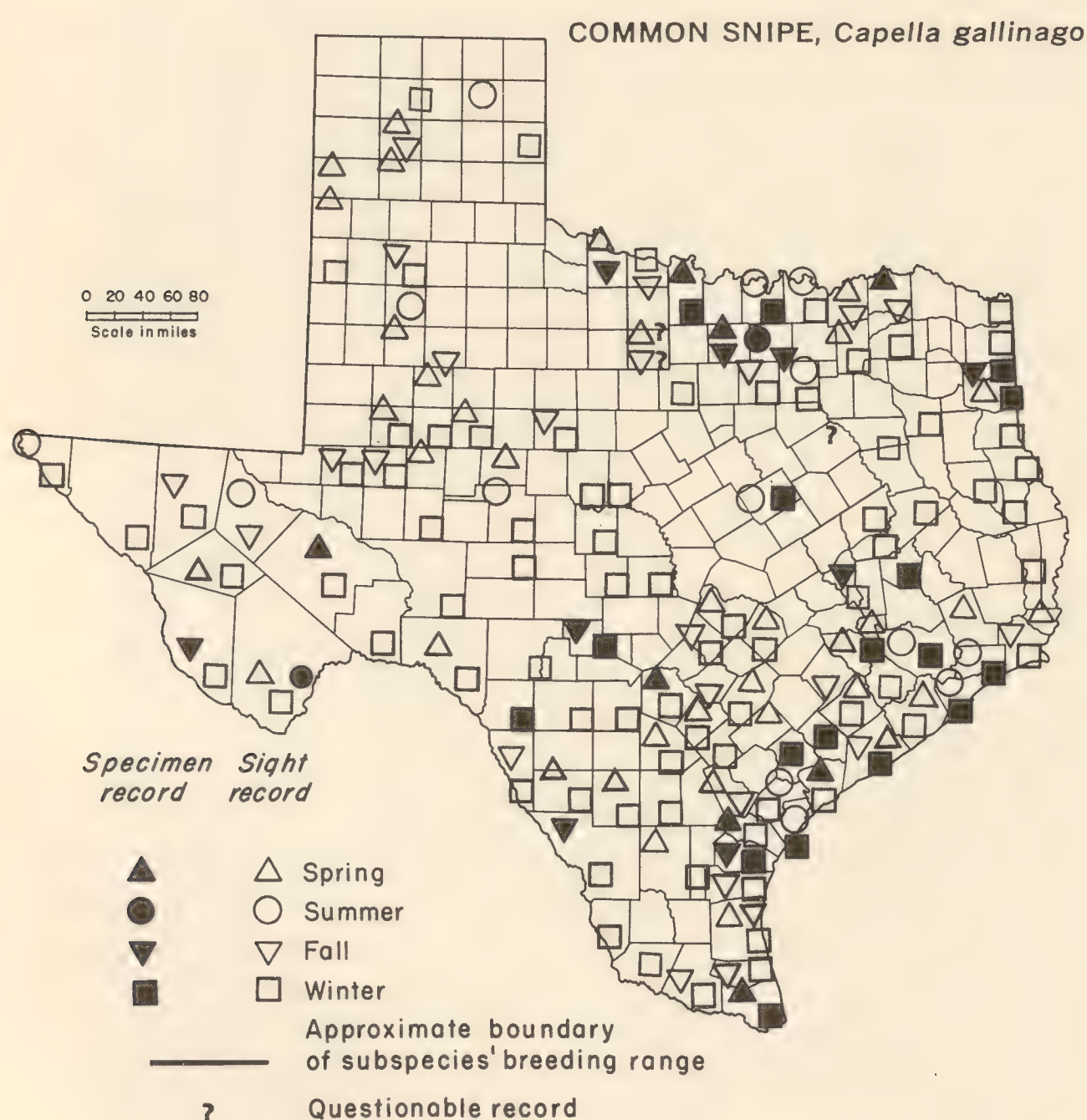
water, using both wings and feet to propel themselves toward escape. When alighting, a bird drops vertically from the air—wings lifted and bill pointed up—and drifts slowly into the grass. Squatting close to the ground, a feeding Common Snipe walks deliberately about with head down as it probes its long, needle-straight bill into mud for small crustaceans, earthworms, snails, and larvae of aquatic insects; it also picks insects off the ground and eats a few marsh seeds. Foraging is done primarily early and late in the day, or throughout the day if there is sufficient cloud cover.

A nasal raspy note (described as *scaipe*) usually sounds when the Common Snipe is flushed. On and about the breeding places, alarmed or protesting birds, often in flight, whistle loud and clear *wheat wheat wheat wheat's*. During the nuptial sky dive, a weird high-pitched, far-carrying winnowing sound is produced by air vibrating the wide spread outer pair of tail feathers; the accompanying tremolo effect is made by a slow quivering of the half-opened wings.

DETAILED ACCOUNT: ONE SUBSPECIES

WILSON'S COMMON SNIPE, *Capella gallinago delicata* (Ord)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Pileum brownish black with middle stripe of dull buff or buffy white, bordered on each side by dull buff superciliary stripe, somewhat mixed with brownish; hindneck mostly dull cinnamon mixed with buff or dull white, and streaked or spotted with fuscous black or fuscous; back and scapulars black, barred or slightly streaked with cinnamon, white, and buffy white; outer edges of scapulars rather broadly dull white or buffy white; rump fuscous, narrowly barred or spotted with buffy white or pale buff; upper tail-coverts hair brown or fuscous, spotted or irregularly barred with dull white and cinnamon buff; tail black, outer feathers barred with hair brown and buffy white, remainder of feathers with broad cinnamon rufous bar succeeded by subterminal narrow fuscous bar and rather narrow tip of white or buffy white; wing-quills hair brown or light fuscous, inner webs of quills paler, tertials fuscous black, broadly barred with cinnamon or white as are scapulars; wing-coverts dull hair brown tipped with white or pale buff; lores with broad stripe of fuscous washed with cinnamon; broad buffy white malar stripe mixed with fuscous; auricular region cinnamon rufous streaked with fuscous; sides of neck narrowly streaked with dull buff, fuscous, and buffy white; chin buffy white; throat dull pale buffy brown mixed with cinnamon, dull buff, and dull white; jugulum similar; sides hair brown, barred with white; breast and abdomen white; crissum fuscous much barred with buffy white or pale buff; lining of wing dark hair brown barred with white. Bill light grayish brown or hair brown, but basal half of culmen wood brown, basal half of mandible greenish buff, and tip of bill black or dark brown; mandible rather paler than maxilla; tongue white; iris dull dark brown or bister; legs and feet olive buff, bluish gray, or pea green; claws black. *Adults, winter*: Acquired by partial postnuptial molt. Similar to nuptial adults but of richer coloration. Bill black, but basal third of culmen and basal half of mandible drab gray; tongue and inside of mouth deep gull gray; bare space on chin drab gray; iris prout brown; legs and feet pea green, but edges of scales smoke gray; claws black. *First nuptial*: Acquired by partial prenuptial molt. Essentially identical with nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Very similar to adults in winter, except for retention of some juvenal feathers. Bill slate black, but basal half of mandible yellowish smoke gray or olive buff; legs and feet olive gray or olive buff. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but buffy edgings on outer



webs of feathers of back, sides of neck, and scapulars broader and more deeply buff; rump much more suffused with cinnamon; wing-coverts usually more broadly tipped with buffy white. Bill slate black, but base of mandible drab gray; iris seal brown; legs and feet clove brown on outside, olive gray on inner side; claws mars brown.

MEASUREMENTS: *Adult male:* Wing, 120.9–130.0 (average, 127.3) mm.; tail, 52.1–63.0 (57.2); bill (exposed culmen), 57.4–67.6 (62.7); tarsus, 27.4–32.0 (30.2); middle toe without claw, 28.4–32.0 (30.2). *Adult female:* Wing, 117.6–135.1 (125.2); tail, 50.0–58.4 (54.6); bill, 58.4–73.4 (65.3); tarsus, 27.9–33.5 (30.7); middle toe, 27.9–32.5 (30.7).

RANGE: N.w. Alaska to n.e. Manitoba and c. Labrador, south to n. (casually to s.) California, Colorado, n. Illinois, s.e. Pennsylvania and New Jersey; also locally in highlands of c. Mexico (Jalisco and Guanajuato). Winters mainly from s. British Columbia, Nebraska, and Virginia through Mexico and Central America to Colombia, Venezuela, and s. Brazil; also West Indies.

TEXAS: *Winter:* Taken north to Wilbarger (Nov. 13) and Cooke, east to Harrison and Chambers, south to Cameron, west to Kinney and Presidio (Nov. 6) cos.

LONG-BILLED CURLEW, *Numenius americanus* Bechstein

SPECIES ACCOUNT

The largest U.S. sandpiper; has extremely long ($4\frac{1}{2}$ – $8\frac{3}{4}$ in.), decurved, brownish bill; grayish legs; in flight reveals cinnamon wing-linings. *Nuptial:* buff-marked brown above without prominent head-stripes; pale cinnamon buff below with narrow brown streaks on neck and sides of breast. *Winter:* more richly cinnamon tinged, especially below. Length, $22\frac{3}{4}$ in.; wingspan, $38\frac{1}{4}$; weight, $1\frac{1}{2}$ lbs.

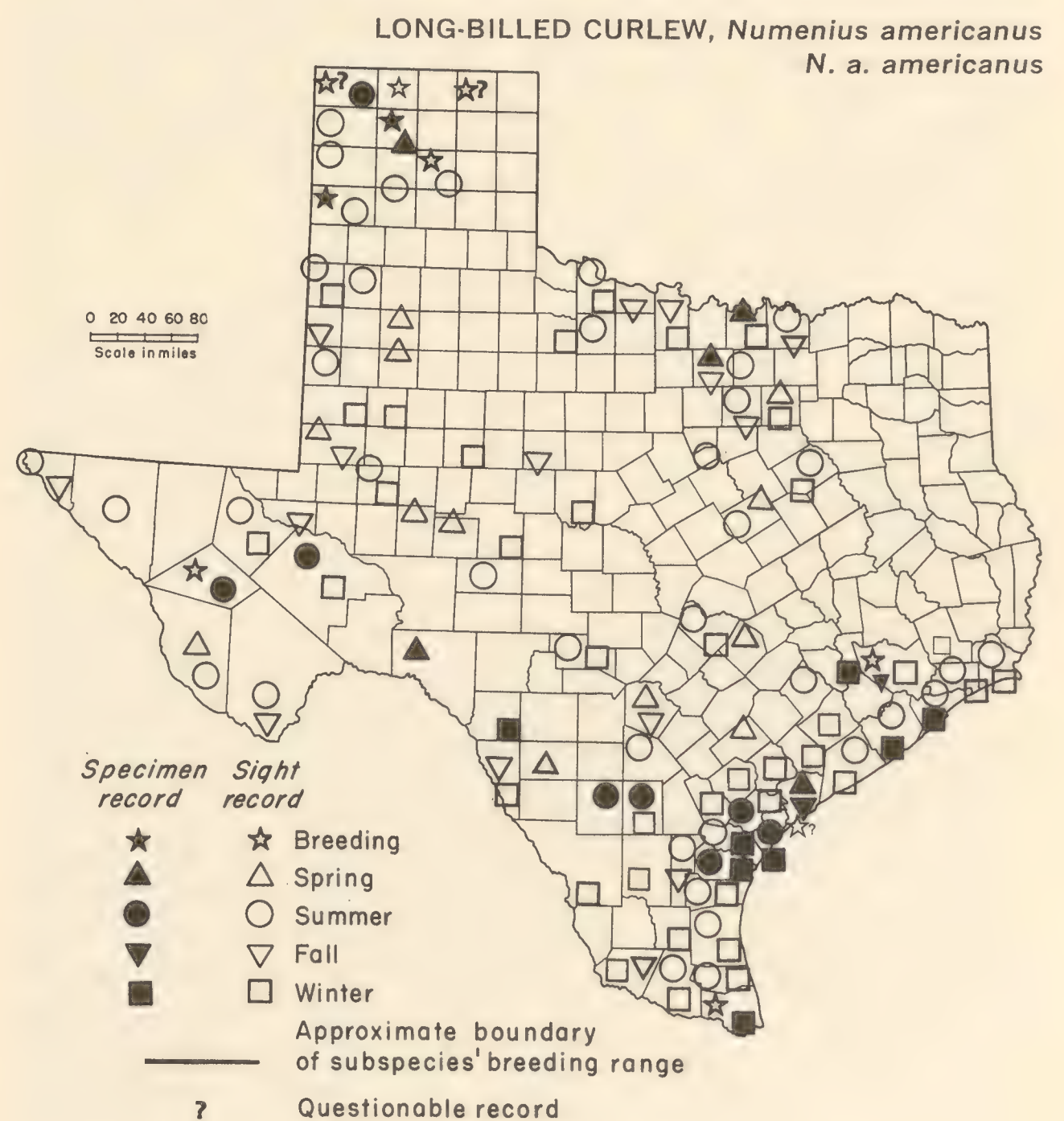
RANGE: S.e. British Columbia to s. Manitoba, south to n.e. California, Utah, and Texas (at least formerly). Winters chiefly from California and w. Nevada and from U.S. Gulf states through Mexico to Guatemala.

TEXAS: (See map.) *Breeding:* Early May to mid-July (eggs, May 15 to June 10; young just fledged, June 1 to June 16) from near sea level to about 50 ft. and from about 3,000 to 4,700 ft. Apparently rare (formerly scarce) and local in northern Panhandle. Until 1972, last recorded breeding: Dallam Co., Buffalo Springs (many nesting, July, 1936, Mrs. R. L. Duke); breeding recently documented: Moore Co., $9\frac{1}{2}$ mi. southwest of Dumas (chicks observed and photographed, June 9, 1972, Carolyn Stallwitz; photos nos. 35 a&b in Texas Photo-Record File, Texas A&M University). Summer records in and near northern Panhandle may indicate local and irregular breeding. One Trans-Pecos record: Jeff Davis Co., Valentine (nest and eggs found, May 15, 1936, A. R. Williams). Three coastal records: Harris Co., marshy pond near Alameda (3 adults and 7 young almost fully fledged but barely able to fly, June 1, 1910, G. F. Simmons); Aransas Co., Rockport (has nested, fide R. T. Peterson); Cameron Co., coastal marsh east of Brownsville (newly fledged young located, June 16, 1877, J. C. Merrill). Regularly oversummers locally along coast, but current nesting highly doubtful. *Migration:* Mid-Mar. to mid-May; mid-July to early Nov.

(extremes: Feb. 17, May 29; June 21, Dec. 3). Very common to common along coast and through Panhandle; fairly common to uncommon through remainder of western two-thirds. *Winter:* Mid-Dec. to mid-Feb. Very common locally to uncommon near coast; locally common to uncommon in and near southern Panhandle; uncommon to scarce in interior south Texas south of 29th parallel; rare in north central Texas.

HAUNTS AND HABITS: The Long-billed Curlew's prodigiously long sickle—up to 8.70 inches in some old females—is the longest super-thin beak in the Americas; some hens of the Far Eastern Curlew, *N. madagascariensis*, have bills almost as long. V-shaped flights of *Numenius americanus*, loudly crying, were once conspicuous over a vast portion of central North America, but hunting of the species and encroaching settlements and farms have restricted breeding chiefly to remnant prairies of southwestern Canada and the western United States. In these places, continued maintenance of grazing land for cattle may insure nesting space for this curlew. Migrants and wintering Longbills appear on short-grass plains, meadows, airports, golf courses, and about prairie ponds and sloughs as well as in fresh and salt marshes, and flats and shores of Gulf coast regions.

When the Longbill rises, its flight is erratic, but underway the bird flies with steady, regular wingbeats. Flocks of curlews, in characteristic formation or long straggling lines, seem to flow across the sky. Alighting, this bird somewhat resembles a heron as it places its feet on the ground and checks its momentum with outspread wings; in true shorebird fashion, wings are held stiffly vertical for a second before the bird folds them. The Longbill is a deliberate feeder as it searches for small crabs, crayfish, snails, frogs, worms, various in-



sects, spiders, and a few berries. It will, however, run swiftly to chase down escaping prey. These curlews are quite wary, and guards are usually distributed about feeding places to alert fellows of any dangers. Birds often forage singly or in small groups of twos or threes. At dusk, large companies move to nighttime roosts in prairie grass or on a sandy island or spoil bank.

Particularly noisy on the breeding grounds, the Long-billed Curlew's alarm note is a loud *cur-lee!* Conversing birds, usually in flight, whistle rapid *kli-ki-ki*'s. The springtime "song" is a drawn-out (sometimes up to three seconds), liquid *curleeeeeeeuuu*.

CHANGES: As is indicated in the TEXAS account above, the Long-billed Curlew seems to be one of numerous cool-climate nesters which apparently is retreating as a breeder from Texas. However, the northwestern Panhandle, where *Numenius americanus* nested as late as 1972, still retains grasslands seemingly suitable for curlews. Breeding activity of birds in this region should be watched closely.

DETAILED ACCOUNT: TWO SUBSPECIES

SOUTHERN LONG-BILLED CURLEW, *Numenius americanus americanus* Bechstein

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Upper parts, including tail-coverts, fuscous, crown without distinct median stripe, but streaked narrowly, hindneck broadly, with pale buff, remainder of upper surface much spotted and edged with light pinkish cinnamon and pale buff, these markings taking form of broad bars on upper tail-coverts and tail; primaries and secondaries fuscous, and, except on outer webs and tips of outermost primaries, broadly barred with cinnamon; tertials similar to tail; wing-coverts similar to back but with larger spots or broader bars of cinnamon or buff; sides of head and neck buffy white or light pinkish cinnamon, narrowly streaked with fuscous; chin white; throat and remainder of lower parts light pinkish cinnamon or cinnamon buff; throat, jugulum, and upper breast numerous but narrowly streaked with fuscous, sides sparingly barred with same; lining of wing cinnamon with only a few small spots of fuscous; axillars plain cinnamon, but slightly marked with fuscous. Bill black or brownish black, but base of maxilla clove brown, seal brown, or burnt umber, base of mandible dull flesh color, light vinaceous fawn, vinaceous pink, or ecru drab; eye-ring black; iris vandyke brown or chestnut; tarsus and bare part of tibia gull gray, pale medici blue, court gray, pale smoke gray, or light olive gray; toes deep gull gray, court gray, pale smoke gray, or slate gray; claws brownish black or grayish black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults but more richly tinged with cinnamon, particularly on lower surface. *First nuptial*: Acquired by partial prenuptial molt. Very similar to nuptial adults. *First winter*: Acquired by partial postjuvenile molt and wear from juvenal. Differs from adults in winter much as does juvenal, to which it is similar, except for somewhat paler colors due to wear. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but colors somewhat more tawny, particularly on lower surface, streaks on jugulum narrower and less numerous. Bill shorter than in adults, slate black or brownish black, but base of mandible dull flesh color or vinaceous buff; inside of mouth vinaceous buff; iris hair brown; legs and feet cinereous; claws brownish black. *Natal*: Upper parts cream buff; two irregular bands of fuscous or fuscous black spots on crown uniting on occiput and extending down back of hindneck; upper parts blotched irregularly with dull black; lores cream buff; auricular

region buffy white; throat cream color; posterior lower parts warm buff; unmarked.

MEASUREMENTS: *Adult male*: Wing, 265.9–282.9 (average, 271.8) mm.; tail, 101.1–111.0 (105.4); bill (exposed culmen), 140.0–159.5 (147.1); height of bill at base, 10.9–14.0 (12.2); tarsus, 76.5–84.6 (81.8); middle toe without claw, 35.6–41.4 (38.4). *Adult female*: Wing, 267.0–294.9 (281.9); tail, 101.1–115.1 (106.1); bill, 165.1–221.0 (192.8); height of bill, 12.4–16.5 (14.2); tarsus, 82.0–96.0 (89.2); middle toe, 37.6–43.4 (40.6).

RANGE: N.e. Nevada and s. Idaho to s. South Dakota, south to c. New Mexico, extreme n.w. Oklahoma, and n.w. Texas (at least formerly). Winters locally from California, Texas, s. Louisiana, and Florida (rarely) through Baja California and mainland Mexico (chiefly on coasts) to s. Guatemala.

TEXAS: *Breeding*: Collected in Dallam, Moore, and Deaf Smith cos. (see species account). *Migration*: Collected north to Dallam (Aug. 1), east to Cooke and Galveston, south to Cameron, west to La Salle (Aug. 15) and Jeff Davis (Aug. 12) cos. Common. *Winter*: Taken along coast northeast to Galveston, southwest to Cameron cos. Common.

NESTING: *Nest*: On moist meadows or dry prairies; in slight hollow on ground; lined with grass and weeds. *Eggs*: 3–5 or even 8 (latter number probably from two females), usually 4; ovate to short ovate to ovate pyriform; light greenish olive, olive buff, seafoam green, or buffy white; with blotches and rounded spots of reddish brown, black, and various shades of lilac, and shell markings of drab and light gray; average size, 66.8 × 47.0 mm.

NORTHERN LONG-BILLED CURLEW, *Numenius americanus parvus* Bishop

DESCRIPTION: *Adults, nuptial plumage*: Similar to *N. a. americanus* but smaller, particularly wing and bill.

MEASUREMENTS: *Adult male*: Wing, 242.1–277.1 (average, 260.4) mm.; tail, 89.9–108.0 (99.3); bill (exposed culmen), 115.1–140.0 (124.7); height of bill at base, 10.9–13.5 (11.7); tarsus, 71.9–84.1 (77.0); middle toe without claw, 33.0–38.6 (35.8). *Adult female*: Wing, 260.1–288.0 (278.4); tail, 98.6–111.5 (104.6); bill, 132.1–169.9 (149.9); height of bill, 10.9–14.0 (13.0); tarsus, 79.0–89.9 (83.1); middle toe, 36.1–39.6 (37.8).

RANGE: S.e. British Columbia to s. Manitoba, south to n.e. California, w. Nevada, n. Idaho, and n.w. South Dakota. Winters locally from c. California, s. Texas, and s.w. Florida (a few) to s. Baja California, Jalisco, Zacatecas, and Tamaulipas.

TEXAS: *Migration*: Collected north to Cooke, east to Harris, south to Cameron, west to Pecos (Aug. 30) cos. Fairly common. *Winter*: Taken in Nueces, Cameron, and Kinney cos. Fairly common.

HUDSONIAN CURLEW, *Phaeopus hudsonicus* (Latham)

SPECIES ACCOUNT

Numenius phaeopus hudsonicus of A.O.U. checklist, 1957 (see Appendix A). Also known as Whimbrel by those who lump American and European populations of this bird. A large sandpiper which resembles the larger Long-billed Curlew, but is separated by its short (3–3¾ in.) decurved bill, and conspicuous dark brown stripe on each side of crown and another of same color through eye. In all plumages, gray-brown (not buffy brown) above; buffy white (not cinnamon buff) below. Length, 17½ in.; wingspan, 32¾; weight, 13¼ oz.

RANGE: N. Alaska to extreme n.w. Mackenzie, Bath-

urst Inlet, and w. coast of Hudson Bay. Winters coastally, chiefly from California and w. Mexico to Ecuador (including Galápagos Islands) and s. Chile, and from Gulf states to Colombia and Brazil. Fall migrants regularly occur in Bermuda.

TEXAS: (See map.) *Migration:* Late Mar. to late May; early Aug. to late Oct. (extremes: Feb. 28, June 17; July 4, Nov. 25). Common to uncommon in spring along coast; rare through most of interior; casual in Trans-Pecos. Uncommon locally to rare in fall along coast; casual inland. *Winter:* Dec. 16 to Feb. 9. Uncommon to scarce along lower coast; scarce on central coast; rare on upper coast.

HAUNTS AND HABITS: A difficult target, the Hudsonian Curlew has persisted in healthy numbers when various other shorebirds—especially its relative, the Eskimo Curlew—have never fully recovered from the hunting pressures of the late nineteenth century. Three factors have aided this species: It is wary and takes flight at the least suggestion of danger; also, migrating birds tend to move in lines instead of more vulnerable compact flocks; finally, in its somewhat offshore migrations in fall and spring it avoids both mid-ocean storms and prairie gunners.

Along cold coasts, usually near fresh water and scattered tracts of trees, isolated pairs of Hudsonians make a well-hollowed depression on tundra or in a moss clump and line it with bits of dry grasses and moss. The birds are aggressive nest defenders and fight off intrusions of Common Ravens and large gulls. Migrants fly near beaches; inland stragglers are attracted to flooded fields, shallow lakes, and river bars.

Flight of the Hudsonian is strong and rather swift; steady wing-beats are interspersed rarely with periods of soaring on set wings. Migrants fly in V-formation or

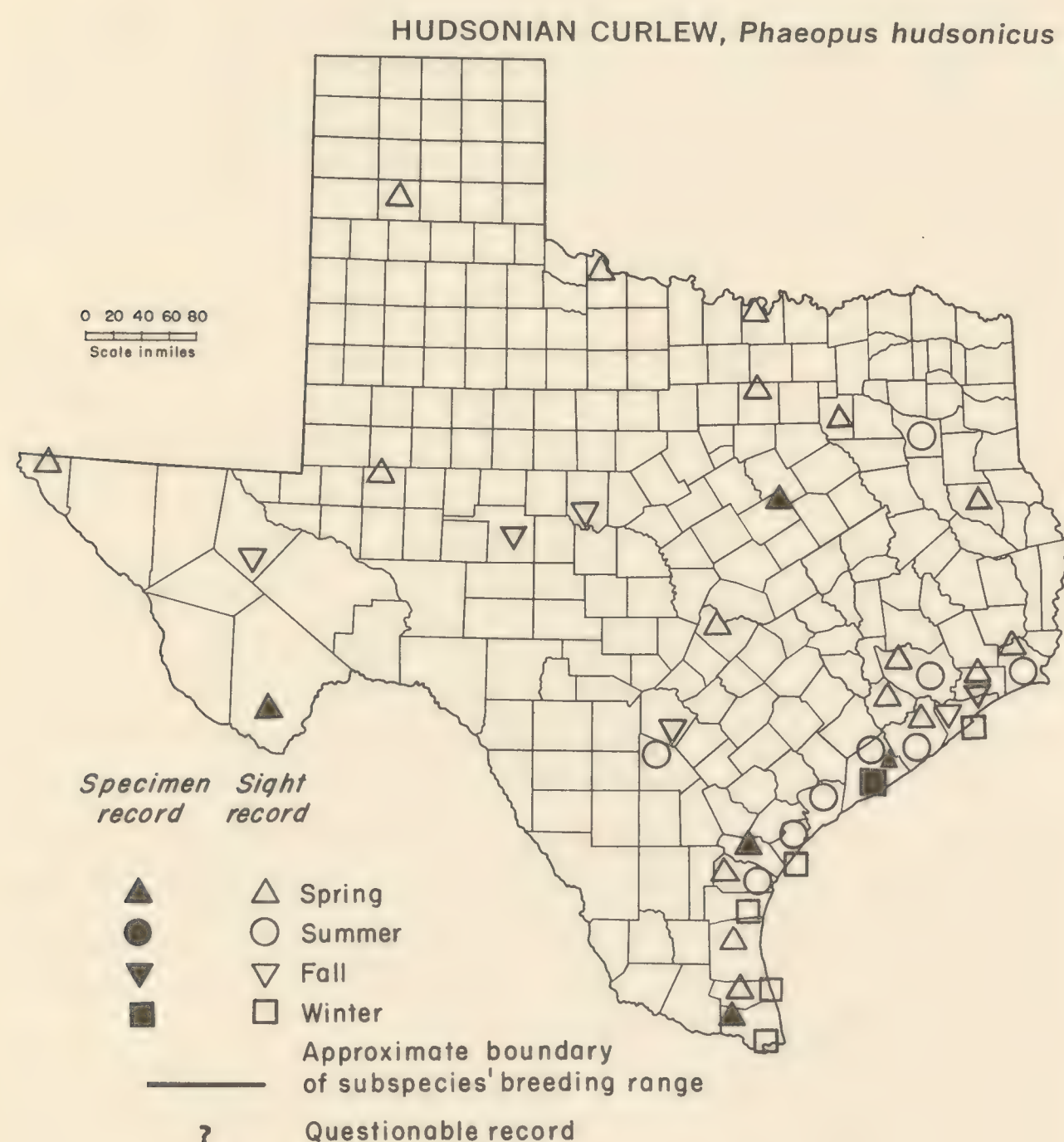
irregular lines. On and about feeding places and when moving to and from the nighttime roost, birds usually fly low across water or ground. When tide is out, birds prefer to feed on edges of salt marsh pools, but at high tide they move to open beaches. Food in coastal situations is chiefly fiddler crabs, shrimps, and other crustaceans, marine mollusks and worms, and various insects. During the breeding season, land mollusks (especially snails), earthworms, beetles, and other insects are consumed; just prior to fall migration birds fatten up on crowberries.

In flight, conversing Hudsonian Curlews exchange sweet rolling series of drawn-out liquid notes. Whistled *pip-pip-pip*'s (also described as *whi-whi-whi*, etc.) are sounded usually by flushing or otherwise disturbed birds.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum clove brown or fuscous, with rather conspicuous middle stripe of pale dull buff somewhat broken by streaks of brown; hindneck pale buff or buffy white, narrowly and numerously streaked with fuscous; remainder of upper parts fuscous, edged and tipped with brownish white, dull pale buffy brown, and dull buff; tail hair brown with numerous narrow fuscous bars; primaries fuscous, inner webs paler and barred with dull pale buff, becoming paler basally, tips of outermost primaries without these bars, shaft of outermost primary yellowish white, of two succeeding primaries brownish white, of others rather light fuscous; secondaries hair brown, barred on both webs with pale buffy gray or dull buff, anterior lesser wing-coverts like back; remainder of wing-coverts hair brown with lighter dull brownish buffy bars and edgings; superciliary stripe buffy white, more or less streaked with fuscous; lores and short postocular stripe fuscous; sides of head dull buffy white, narrowly streaked with fuscous; sides of neck pale dull buff or pale brown, narrowly streaked with fuscous; lower parts pale buff or buffy white, lower throat, jugulum, and upper breast narrowly and numerously streaked with fuscous or hair brown; sides, flanks, and crissum (mostly on outer feathers) tinged with cinnamon and barred with fuscous and hair brown; lining of wing dull light pinkish cinnamon barred with hair brown; axillars of similar color and more broadly barred with hair brown. Bill dull black or clove brown, but base of mandible ecru drab, vinaceous buff, or light brown; bare space on chin smoke gray; iris vandyke brown or black; legs cinereous, dark french gray, plumbeous, or greenish slate color; feet plumbeous black or dark french gray; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, except sometimes more or less faded juvenal wing-coverts are retained. *First winter:* Acquired by partial postjuvinal molt. Similar to adults in winter, except for faded or worn wing-coverts retained from juvenal. Legs and feet similar in color to those of nuptial adults, but tarsus in front washed with olive gray. *Juvenal:* Acquired by complete postnatal molt. Very similar to nuptial adults, but markings on upper breast and jugulum much narrower; upper parts warmer brown; light markings cinnamon or buff, more conspicuous than in adults. Bill much shorter than in adults, dull grayish brown, basal portion of mandible and edges of maxilla pale purplish flesh color; legs and feet dull bluish gray.

MEASUREMENTS: *Adult male:* Wing, 231.1–257.0 (average, 239.3) mm.; tail, 87.9–101.1 (92.7); bill (exposed culmen), 77.0–93.5 (83.3); tarsus, 52.1–61.0 (55.6); middle toe without claw, 33.0–36.6 (35.1). *Adult female:* Wing, 240.0–267.0 (252.2); tail, 91.9–102.1 (97.3); bill, 84.1–95.5 (91.4); tarsus, 54.1–61.0 (57.7); middle toe, 34.0–38.6 (35.8).



TEXAS: *Migration*: Collected along coast northeast to Matagorda, southwest to Cameron cos.; inland in McLennan and Brewster cos. *Winter*: One specimen: Matagorda Co., 4 mi. west of Palacios (female, Feb. 27, 1960, W. B. Davis).

ESKIMO CURLEW, *Phaeopus borealis* (Forster)

SPECIES ACCOUNT

Numenius borealis of A.O.U. check-list, 1957 (see Appendix A). A very small curlew—near half the bulk of a Hudsonian Curlew, not much larger than a Golden Plover—with rather short (2–2½ in.), slender, slightly decurved bill. Darker above than grosser-billed Hudsonian and lacks bold head-stripes; rich buff under parts, markedly lighter than upper parts; dark grayish blue or greenish black legs. Displays cinnamon buff wing-lining. Most closely resembles Least Curlew, *Numenius minutus*, of Siberia (winters in Australia), but wing-lining of *minutus* pale buff and bill slightly less decurved; in the hand, hind-tarsus of *minutus* shows distinctly transverse scutellation, whereas that of *borealis* is indistinctly, if at all, transversely scutellate. Length, 13¾ in.; wingspan, 27½; weight, 13½ oz.

RANGE: *Almost extinct*. Last recorded specimens from continental North America: Nebraska, Norfolk (Apr. 17, 1915); Maine, Schoodic Point (Aug. 28, 1929); Labrador, Battle Harbor (Aug. 29, 1932). Latest specimen: West Indies, Barbados (Sept. 4, 1963; identified by James Bond; skin in Academy of Natural Sciences of Philadelphia collection). Formerly bred in n. Mackenzie (south to Point Lake), west probably to n.w. Alaska. Wintered from n. Argentina and s.e. Brazil to s. Chile and s. Argentina. Migrated in spring chiefly over interior from Argentina through Texas to

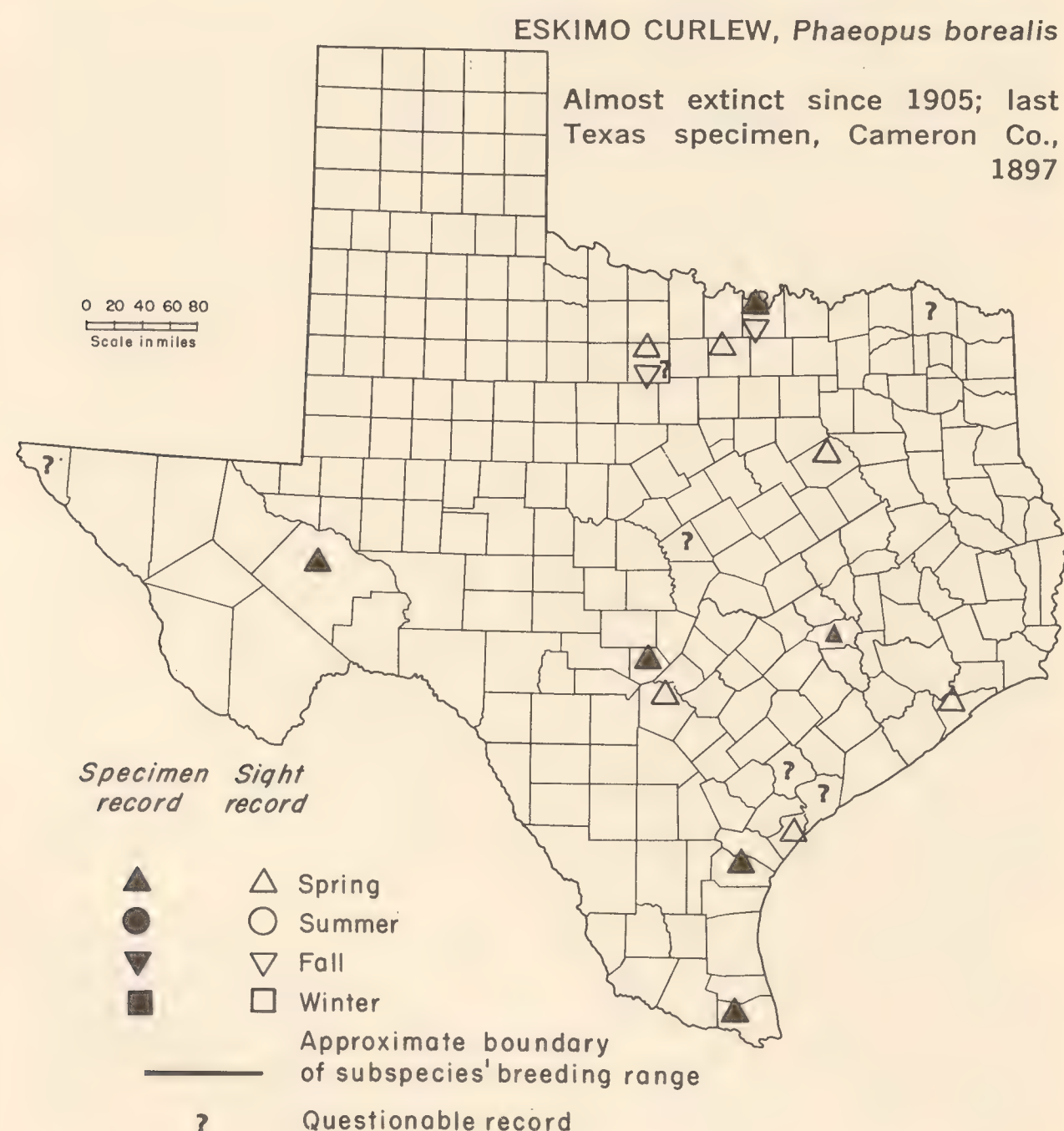
American Arctic; in fall mainly along and off Atlantic seaboard through n.e. United States and Lesser Antilles to Brazil.

TEXAS: (See map.) *Migration*: Mid-Mar. to late Apr. (extremes: Mar. 7, May 4). On the verge of extinction since 1905, but formerly abundant to uncommon in spring through most of state; one fall sighting: Cooke Co., near Gainesville (Oct. 15, 1877, G. H. Ragsdale). No record between 1905 and 1945. Recent sightings: Galveston Co., Galveston Island—chiefly in fields bordered by S Road, 7 Mile Road, Gulf beach, and 7½ Mile Road (2 on Apr. 29, 1945, J. M. Heiser, Jr., Mabel Kaiser, Edna Miner; 1 from Mar. 22 to Apr. 26, 1959, T. B. Feltner initially, later Dudley Deaver, E. P. Edwards, V. L. Emanuel, R. L. Fowler, Miner, Mr. and Mrs. J. B. Strickling, G. G. Williams, M. A. Yramategui, et al.; 1 from Apr. 3 to 6, 1960, C. H. Aiken III, Emanuel, Mr. and Mrs. H. S. Hoffman, Clinton Snyder, Linda Snyder, Stricklings, S. G. Williams, Yramategui, et al.; 1 from Mar. 31 to Apr. 3, 1961, Aiken, Emanuel, Horace Jeter, G. H. Lowery, Jr., H. L. Patten, J. R. Stewart, Stricklings, Yramategui, et al.; 2 from Mar. 24 to Apr. 15, 1962, observed by most of above, also Hardin Craig, Mr. and Mrs. J. R. Deshayes, Mr. and Mrs. J. O. Ellis, E. B. Kincaid, Jr., G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett, M. E. Williams, et al., and documented with widely published photographs by D. L. Bleitz; 2 on Mar. 29, 1964, Deshayes and Stricklings); Aransas Co., at and near Rockport (1 from Apr. 27 to 29, 1950, Connie Hagar; 1 on Apr. 11, 12, 1963, Hagar, et al.; 1 on Apr. 30, 1968, J. E. Lieftinck).

In his note "Probable Eskimo Curlew on Galveston Island, Texas" (1959, *Auk* 76: 539–41), G. G. Williams first alerted curlew watchers to the possibility that the curlew in question during spring 1959, could have been a Least Curlew, *Numenius minutus*, of Asia and Australia, the likelihood of which Williams regarded as highly improbable. Most subsequent sightings were made with the knowledge of this possibility, and on each occasion many of the observers mentioned above carefully noted the cinnamon buff axillars and under wing-coverts of the curlews under study.

HAUNTS AND HABITS: For almost three-quarters of a century, the Eskimo Curlew has fluttered and teetered on the brink of extinction without, so far as is known, falling into complete oblivion. Perhaps even more extraordinary is the fact that it is the Eskimo, the smallest North American curlew, and not the largest—the Long-billed—that is almost extinct. Ordinarily this situation is reversed: Throughout the world it is generally the most bulky species or race within a family or genus which is almost or entirely finished. Some U.S. examples: Great White Heron, *Ardea occidentalis*; Trumpeter Swan, *Olor buccinator*; Giant Canada Goose, *Branta canadensis maxima*; California Condor, *Gymnogyps californianus*; Whooping Crane, *Grus americana*; Great Auk, *Pinguinus impennis*; and Ivory-billed Woodpecker, *Campephilus principalis*.

In the northwestern American Arctic, this once-flourishing curlew bred on barren open tundra; its nest





Eskimo Curlew, *Phaeopus borealis*

was a hollow in the ground lined with a few decayed leaves. The eggs, usually four, were light olive green or brown with dark brown spots; their size averaged 51.3×35.6 mm. In fall migration, birds moved eastward in immense flocks, chiefly to the coast of Labrador, to fatten on crowberries (*Empetrum nigrum*) and other wild fruit before the oceanic flight to wintering grounds on the pampas of Argentina. On the return trip in spring, they moved inland, crossing and resting upon the grassy U.S. Great Plains where they feasted on insects, especially grasshoppers and their eggs; the bird's virtual demise is certainly a loss to agriculture. Between 1870 and 1890, market hunting of the unsuspicious and gregarious "dough-bird" (so called because its plump breast felt like a ball of dough) reduced Eskimo Curlew numbers to a precariously low level where they lingered into the 1960's.

Firm, direct, and swift on the wing, flocks of these birds, in characteristic curlew fashion, flew in impressive wedge-shaped formations. They also threaded across the sky in long, dangling lines, often whirling, twisting, and spiraling as they moved along. Individuals glided briefly near the ground before alighting.

Companies of Eskimo Curlews in flight conversed incessantly with low chattering *tr-tr-tr-tr*'s and soft melodious *bee bee bee* whistles; twittering of a large flock often carried a long distance. When feeding on the ground, birds sounded chirruping whistles. According to Deaver and Feltner, the 1959 Galveston individual uttered a low tremulous whistle unlike any vocalization of the Long-billed or Hudsonian curlews.

CHANGES: During spring migration in the last century, this curlew was exceedingly abundant on the prairies of Texas, particularly in the middle portion of the state. It occurred in immense flocks up to about 1875, when its ongoing diminution became apparent. Until 1890, it was observable in at least small flocks, but after that date it became greatly restricted in numbers; however, H. P. Attwater reported seeing small flocks until about 1900. Its last appearance in Texas prior to 1945 was recorded by J. D. Mitchell, who found three individuals feeding with four Black-bellied Plovers in 1905 on the prairies of Victoria County. (See TEXAS section for mid-20th century records.)

Owing to the interest attached to this nearly extinct species, the following records made by G. H. Ragsdale near Gainesville, in Cooke County, Texas, may be of interest: March 17, 1876, first flock seen; March 20, 1877, noted; March 30, 1877, abundant; October 15, 1877, observed; March 12, 1878, seen; April 2, 1878, seen; March 17, 1880, seen; March 7, 1884, seen; March 8, 1884, seen; March 7, 1885, first seen flying south; March 12, 1885, seen; March 27, 1885, thousands reported on high prairies by a boy; March 30, 1886, small flocks seen flying southwest in northeast sleet storm; March 24, 1887, first one seen; March 25, 1888, reported by W. Kraig on the prairies for some days previous; March 26, 1889, first heard; March 27, 1889, a dozen reported seen.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum fuscous black or fuscous, feathers edged with pale buff or buffy white and with narrow middle stripe of pale buff, much interrupted by dark brown streaks or spots, and not so well defined as in Hudsonian Curlew, *P. hudsonicus*; hindneck pale buff, streaked with fuscous; upper surface fuscous black or fuscous, all feathers spotted on edges with buffy white, cinnamon buff, or dull cinnamon, these markings becoming irregular bars on upper tail-coverts; tail hair brown, narrowly and numerously barred with dull brownish neutral gray, primaries plain fuscous, without lighter markings, but darker at tips, paler on inner webs, shaft of outermost yellowish white, except at tip, shafts of two succeeding feathers brownish white or pale fuscous, rest light brown or fuscous; secondaries hair brown, paler on inner webs; tertials and anterior lesser wing-coverts like back, but wing-coverts with only slight buffy white tips; remainder of lesser wing-coverts like back, but somewhat paler, and greater coverts hair brown with narrow buffy white edgings; sides of head, including superciliary stripe, buffy white, cheeks narrowly streaked with fuscous; lores with more or less ill-defined streak of same; sides of neck dull buffy white, streaked with fuscous; chin and upper throat buffy white; remainder of lower surface between pinkish buff and vinaceous buff, anteriorly streaked narrowly with fuscous, on breast with irregular V-shaped bars; sides and flanks broadly barred with fuscous; lateral and longest lower tail-coverts with a few narrow irregular bars of fuscous; lining of wing and axillars cinnamon, barred with fuscous. Bill brownish black, base of mandible pale light orange; iris dark brown; legs and feet dark grayish blue or greenish black; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but somewhat more deeply or richly colored. *First nuptial:* Acquired by partial prenuptial molt. Very similar to nuptial adults. *First winter:* Acquired probably by partial postjuvenile molt. Similar to first nuptial, differing probably only in retention of some juvenile feathers. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter except feathers of back, scapulars, tertials, and upper wing-coverts, more broadly margined with narrow spots or bars of pinkish buff or cinnamon; also lower surface has fewer dark markings.

MEASUREMENTS: *Adult male:* Wing, 198.1–212.6 (average, 205.2) mm.; tail, 71.9–83.6 (78.2); bill (exposed culmen), 48.0–53.6 (51.6); tarsus, 40.9–45.0 (42.9); middle toe without claw, 23.9–25.9 (24.6). *Adult female:* Wing, 192.0–215.1 (205.0); tail, 75.9–82.0 (79.7); bill, 48.0–60.5 (55.6); tarsus, 42.9–46.5 (44.7); middle toe, 23.9–26.4 (25.1).

TEXAS: *Migration:* Total birds collected in state: Cooke Co., Gainesville (Apr. 8, 1876, 3 on Mar. 7, 1879, Mar. 17, 1880, G. H. Ragsdale); Lampasas Co., Lampasas (1 killed from flock of about 20 in 1890, A. S. Eldredge); Washington Co., Long Point (Apr. 23, 1868, G. Lincecum); Nueces Co. (several shot, Mar. 8, 1877, and 1 taken from flock of at least 20, Mar. 15, 1877, G. B. Sennett); Cameron Co., Brownsville (Apr. 2, 1889, Fields and Armstrong; Mar., 1897, Mar. 22, 26, 27, 28, 1889, Mar. 28, Apr. 2, 1890, F. B. Armstrong); Kendall Co., Boerne (3 on Mar. 17, 1880, N. C. Brown); Pecos Co., Fort Stockton (3 on May 4, 1860, P. Duffy).

UPLAND PLOVER, *Bartramia longicauda* (Bechstein)

SPECIES ACCOUNT

Upland Sandpiper or Bartramian Sandpiper of some authors. A medium-sized, slender-necked sandpiper with big ploverlike brown eyes; short ($1\frac{1}{8}$ in.), black-tipped yellowish bill; dull yellow legs. In flight, shows dark brown primaries, rump, and median line through

long wedge-shaped tail; faintly black-barred buffy outer tail feathers. Buff-streaked brown above, darkest on crown; pale buff below with brown streaks on throat and breast, and dark brown chevrons on sides of breast becoming bars on flanks. Fall adult is buffier. Length, 12 in.; wingspan, 22; weight, 6¼ oz.

RANGE: Locally from s. Alaska and s. Manitoba to c. Michigan and c. Maine, south to n.e. Oregon, c. Colorado, Oklahoma, and Virginia (rarely). Winters on pampas of n. and c. Argentina, extreme s. Brazil, and Uruguay.

TEXAS: (See map.) *Summer:* Irregularly occurs throughout June locally in northern third of state, but evidence of nesting lacking. Said to have bred in former years (19th century) at Gainesville, Cooke Co. (fide G. F. Simmons). *Migration:* Mid-Mar. to early May; July to early Oct. (extremes: Mar. 2, May 31; June 21, Nov. 27). Very common (some years) to fairly common through all parts east of Pecos River Valley; uncommon to rare through most of Trans-Pecos. *Winter:* Dec. 18 to Jan. 28; no Feb. record. Accidental: Tom Green Co., San Angelo (see detailed account); Webb Co., Laredo (see detailed account); Harris Co., Houston (a few seen about Dec. 18, 1924, G. M. Rid-dick; 8 reported on Audubon Christmas Bird Count, Jan. 2, 1966, Mr. and Mrs. L. A. M. Barnette, Mr. and Mrs. W. C. Mebane).

HAUNTS AND HABITS: The slender, long-tailed Upland Plover is actually a sandpiper which displays Golden Ploverish tendencies in its haunts and habits. A bird of upland prairies, pastures, and expansive grassy fields, the species is less attracted to water than is any other American sandpiper. Migrants throughout Texas linger to feed and rest in short grass on meadows, mesas,

plains, and coastal prairies, typically well away from shorelines. Birds seem skittish in fall, but less wary in spring when they are tired from their long flight from Argentina. The camouflaged Upland Plover is heard more often than seen; mellow, fluttery whistles drift from the night sky during spring and fall migrations. To naturalists on both the North American Great Plains and the Argentine Pampas (notably W. H. Hudson in the latter), these nocturnal notes have long signaled that wonderful navigation is proceeding; without instruments—unless its bill acts as a compass needle—an adult bird flies seven thousand miles to its exact winter feeding territory. When spring comes, the individual returns to its previously used nesting acreage in Canada or the northern United States. Birds move singly, in pairs, or in loose flocks, these sometimes of considerable size.

The Upland is swift and strong on the wing; in flight it bows its long, slender, pointed wings like a Spotted Sandpiper. On the ground it strides gracefully. Plover-like, it runs along—long neck usually held high—with abrupt stops and starts as it watches for prey or danger. Motionless birds blend quite effectively into their grassy surroundings and are difficult to detect. The present species, unlike many members of its family, often perches on fence posts. The Upland Plover, rendering a great service to agriculture, devours a variety of injurious insects—grasshoppers, locusts, crickets, weevils, beetles, others.

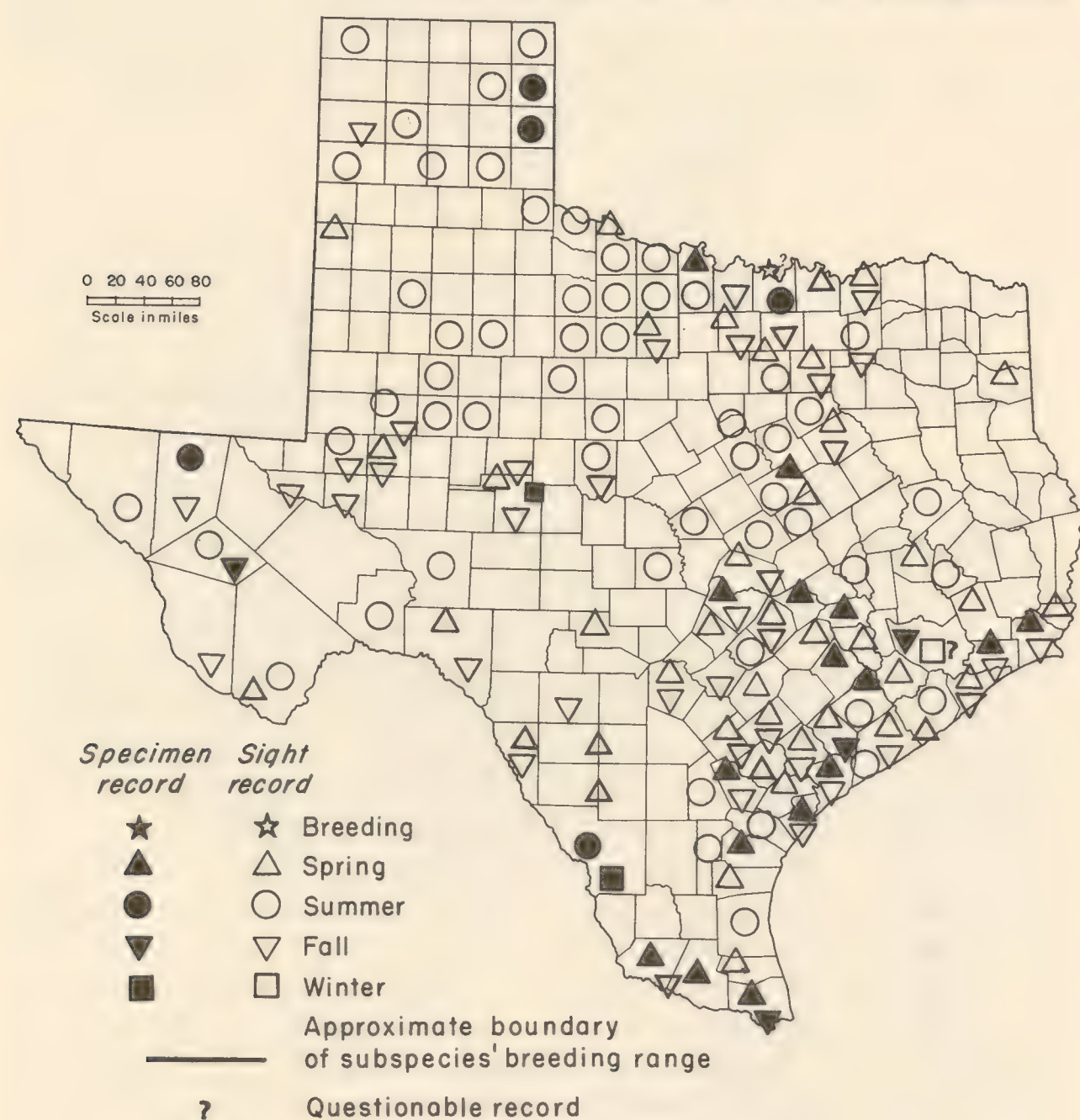
"Song" of the Upland Plover, heard chiefly on or over the breeding grounds, is an enchantingly weird, long drawn-out whistle: *whoooooleeeeeee, wheellooooo-ooooo*. Rich, fluttering notes, usually in triplicate, are sounded during migration. This whistle varies from a rapid, rolling *hu-hee-he* or *hu-hee-ly* to an even faster, more staccato *hu-hu-hu*, *tu-hu-hu*, or *chu-ch-ch*. The alarm and flush note is an emphatic *kip-ip-ip-ip*.

CHANGES: Rampant market hunting in the United States between 1870 and 1900 nearly wiped out the Upland Plover and various other sandpipers. With protection on the nesting grounds, the Upland recovered by the 1930's to fairly good numbers which have been maintained through 1972. However, the species can never regain its pristine abundance. The bird reproduces slowly (only four eggs per year), its migration route is long and very hazardous, and increasing numbers of hunters are blasting away at it in South America.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum dull black or fuscous, forehead buffy white streaked with fuscous, crown more or less streaked with pale buff and with narrow more or less interrupted median stripe of same; hindneck dull grayish buff or cinnamon buff, narrowly streaked with fuscous; remainder of upper parts fuscous black or fuscous, feathers edged and tipped with dull buff, cinnamon buff, and dull white; rump and middle upper tail-coverts clove brown with slightly lighter feather tips, longest upper tail-coverts with buffy spots on outer webs, lateral upper

UPLAND PLOVER, *Bartramia longicauda*



tail-coverts buffy white terminally, and with pale buff or buffy white bars; tail with middle feathers hair brown, narrowly barred with black, remaining feathers pinkish buff or light pinkish cinnamon, spotted or imperfectly barred with black on edges and broadly tipped with white; primaries fuscous, paler on inner webs, and outermost primaries barred, except at tips, broadly with white, diminishing in extent on inner feathers, inner primaries also tipped with white, shaft of outermost primary white, of rest fuscous; secondaries hair brown, tipped with white, and broadly barred on inner webs with white; tertials like back; anterior lesser wing-coverts fuscous, remaining wing-coverts hair brown, much barred with white, buffy white, and cinnamon buff; sides of head buffy white, auriculars and superciliary stripe narrowly streaked with fuscous; chin and upper throat white; lower throat, jugulum, upper breast, and sides of neck dull pale pinkish buff, anteriorly streaked on breast with V-shaped bars of fuscous; remainder of lower parts white, sides barred with fuscous or fuscous black; lining of wing white barred with hair brown. Bill ocher yellow or yellowish green, but tip and maxilla black or brownish black; inside of mouth and tongue ocher yellow; iris vandyke brown or dark hazel; legs and feet maize yellow, yellowish green, or light yellowish gray; toes darker, claws black or brownish black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but plumage more strongly suffused with buff. *First nuptial*: Acquired by partial prenuptial molt. Like nuptial adults. *First winter*: Acquired by partial postjuvinal molt. Similar to adults in winter, except for retention of juvenal wing-quills and upper wing-coverts. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but head, hindneck, scapulars, and wings with light areas of deeper buff or cinnamon; markings on breast and jugulum narrower and less well defined. Maxilla and tip of mandible dull black, slate black, or clove brown; rest of mandible yellowish cream color or pale pinkish gray; iris prout brown; legs pale olive gray, maize yellow, or cream color; toes maize yellow or cream color; claws ecru drab to slate black. *Natal*: Forehead buffy white with central spot of blackish and cinnamon; remainder of upper parts mixed black, cinnamon, and dull white, with black stripe on anterior edge of wing; sides of head and lower parts buffy white, breast washed with cinnamon.

MEASUREMENTS: *Adult male*: Wing, 152.9–164.1 (average, 160.3) mm.; tail, 76.5–87.1 (81.8); bill (exposed culmen), 27.4–33.0 (29.7); tarsus, 45.5–52.1 (48.3); middle toe without claw, 23.1–26.9 (25.1). *Adult female*: Wing, 159.0–183.1 (170.2); tail, 78.0–90.9 (84.3); bill, 27.4–33.0 (29.7); tarsus, 46.0–53.1 (49.8); middle toe, 24.4–26.9 (25.7).

TEXAS: *Summer*: See species account. *Migration*: Collected north to Hemphill (July 15), east to Cooke and Jefferson, south to Cameron, west to Jeff Davis and Culberson (Aug. 2) cos. *Winter*: Five specimens: Tom Green Co., San Angelo (Jan. 1, 1883, W. Lloyd); Webb Co., Laredo (Jan. 26, 27, and 2 on Jan. 28, 1886, F. B. Armstrong).

NESTING: *Nest*: In wet meadows, grassy fields, pasture slopes, dry grassy prairies, or even cornfields; usually in depression in ground, hidden amid grass; composed of a little grass, a few leaves and small twigs. *Eggs*: 3–5, usually 4; ovate to short ovate; little or not at all glossy, cream white to pale olive buff, cinnamon buff, deep pinkish drab, or pinkish cinnamon, with small spots or shades of reddish brown, sometimes blotched with same, and with shell markings of violet gray, lilac, gray, or light gray; average size, 45.0 × 32.5 mm.

SPOTTED SANDPIPER, *Actitis macularia* (Linnaeus)

SPECIES ACCOUNT

A fairly small sandpiper which teeters almost constantly as it walks. Flight, with shallow wing-beats, reveals white wing-stripe and white-tipped secondaries. *Nuptial*: largely olive gray above; white line over eye;

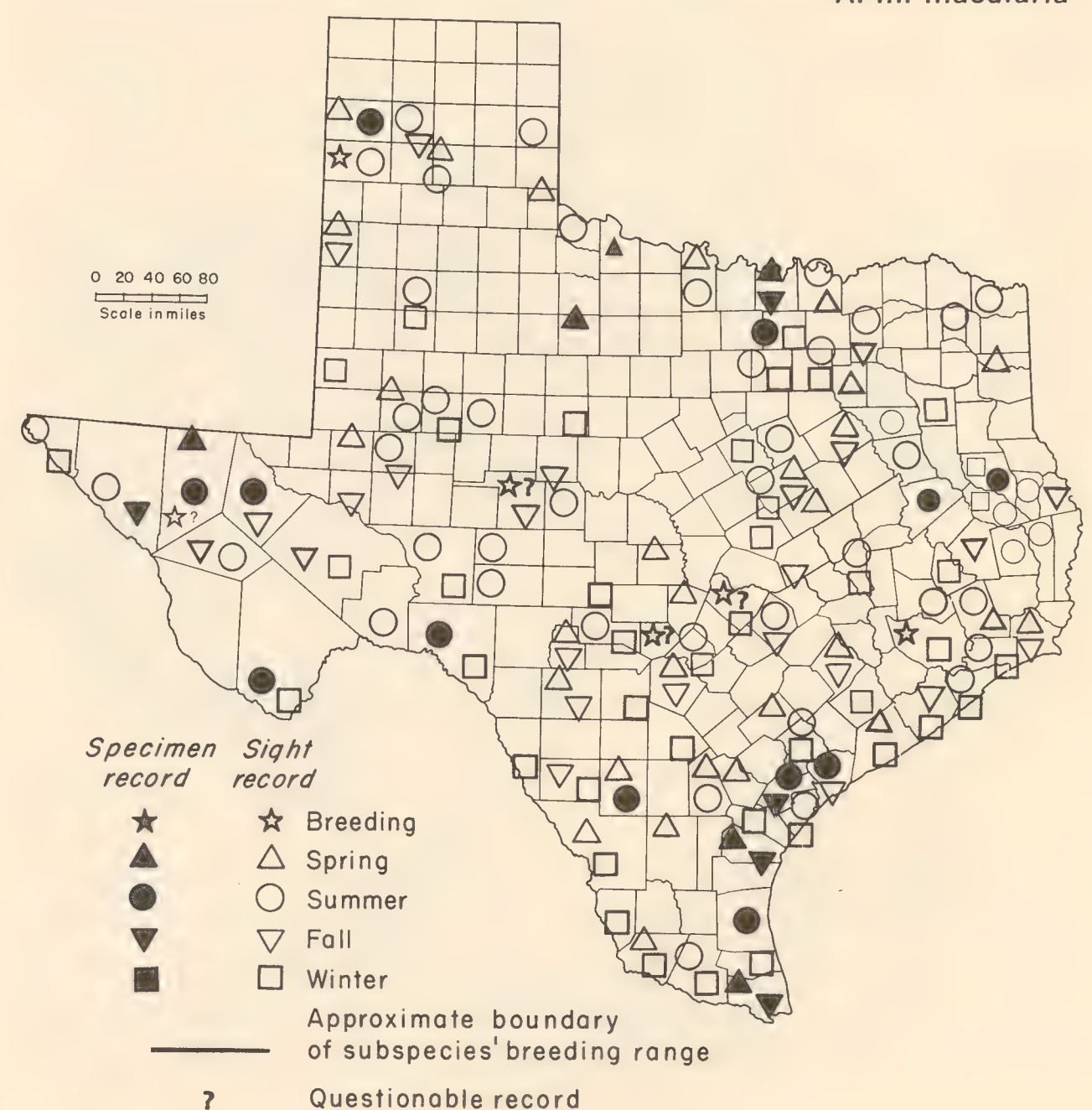
white below with large rounded blackish spots; yellowish orange bill with black tip; grayish or flesh-colored legs. *Winter*: brownish gray smudge on side of breast at shoulder; no spotting below; bill largely dark brown; legs and feet greenish. Length, 7½ in.; wing-span, 13¼; weight, 1½ oz.

RANGE: N.w. Alaska to n.e. Manitoba and c. Labrador, south locally to s. California and w. North Carolina. Winters from w. Washington, w. California, s. Texas, and South Carolina through Mexico and Central America to s. Brazil, rarely to Argentina; also West Indies.

TEXAS: (See map.) *Breeding*: Two definite records: Harris Co., head of Buffalo Bayou (broods of young seen, May 5, 1837, John J. Audubon); Deaf Smith Co., Glenrio (parent with young, July 14, 1920, A. J. Kirn). Recent breeding suspected in Culberson Co., McKittrick Canyon (1 male collected, gonads, 10 mm., May 31, 1972, G. A. Newman; original no., 272). Irregularly occurs throughout summer locally in northern quarter of state and on and near Edwards Plateau, but recent nesting evidence lacking. *Migration*: Late Mar. to late May; mid-July to mid-Oct. (extremes: Feb. 20, June 14; June 27, Nov. 22). Common to fairly common virtually throughout. *Winter*: Early Nov. to mid-Mar. Fairly common to uncommon in southern half; scarce to rare in northern half.

HAUNTS AND HABITS: The Spotted Sandpiper is one of the most widely distributed of North American shorebirds. Diverse breeding climes across the continent—arid or damp and from sea level to timberline in mountains—suit this species. In Texas, the shoreline of practically any body of water, whether still or swiftly flowing, fresh or salt, man-made or natural, is a potential resting and feeding place for migrants. Individ-

SPOTTED SANDPIPER, *Actitis macularia*
A. m. macularia



uals regularly winter in similar situations in southern portions of the state. The Spotted, as ungregarious as the Solitary Sandpiper, usually appears singly (it is territorial in winter), sometimes in pairs or scattered companies (especially during autumnal migration).

Flight of the Spotted is distinctive: The bird lifts up from the shore, rapidly beats its wings—they appear to quiver—then sets them with tips depressed as it sails, sometimes rocking from side to side, close to the water's surface. On long flights, it maintains itself with regular wing-strokes. On coasts, where it wades in shallows less than other sandpipers, the Spotted picks small crustaceans, mollusks, and marine worms from beaches and flats of inlets and bays. Inland, it teeters (more actively and energetically than does the Solitary Sandpiper) on shores or at water's edge as it searches for small fish, crustaceans, and a host of insects; individuals also feed amid low vegetation of meadows and fields. Locusts, grasshoppers, caterpillars, worms, and crickets are a few of the insects it consumes; those that fly, the bird often catches on the wing. The Spotted Sandpiper, in the manner of a Dipper, has been observed diving and swimming underwater. Sometimes an extremely hard-pressed individual flies from air into water and continues under the surface with slow but unlabored wing-beats. Underwater, head and neck are extended, legs either kick or trail (suggesting a tiny heron in flight), and an array of air bubbles often glistens on its outstretched wings. Downstream—in one instance a bird swam twenty feet—it surfaces, still flying. In shallow water it has been seen running on the bottom for a short distance. Another atypical habit of this bird is to perch on thin supports; front toes closer together than those of most waders and a more developed hind toe apparently give the Spotted the extra grip it needs to successfully alight on thin branches, cattail heads, and telephone or fence wires.

Flushing or otherwise, Spotted Sandpipers utter series of *peet-weet's* or many clear *weet!* notes.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN SPOTTED SANDPIPER, *Actitis macularia macularia* (Linnaeus)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts, including scapulars and tertials, grayish citrine drab with metallic sheen, rump grayish deep olive, pileum streaked with fuscous and rest of upper parts more or less barred and spotted with fuscous, these most regular on tertials and scapulars, rump almost unmarked, upper tail-coverts barred like back; middle tail feathers like back; remainder of rectrices mostly hair brown, outer feathers broadly barred with white or dull buff, and broadly tipped with white; wing-quills light chaetura drab, secondaries broadly tipped with white; wing-coverts like back, inner feathers more or less barred with fuscous; sides of head similar to upper parts but much mixed with white, and with dull white superciliary stripe interrupted with spots of fuscous; lower parts white with roundish spots of chaetura drab, this very small on chin and upper throat, larger elsewhere, lower tail-coverts with relatively few spots; lining of wing white with mottlings of hair brown. Bill light wax yellow, pinkish ochraceous buff, orange-yellow, salmon color, or flesh

color, but mandible darker, and tip of bill black; tongue and inside of mouth white; iris prout brown or vandyke brown; legs and feet light olive gray or grayish white to light dull yellow, cream color, or dull maize yellow; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts as in nuptial adults but with very few or no markings except on wing-coverts, which are more or less obscurely barred with fuscous; sides of head brownish gray with dull buffy white superciliary stripe; lower parts white, jugulum more or less tinged with brownish gray. Bill dull brown above, base of mandible flesh color; feet dull green. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but sides of neck more grayish and breast with less, sometimes with few, dark spots; some wing-coverts retained from juvenal. Maxilla and tip of mandible dark brown; rest of mandible flesh color or yellow; eyelids white; iris dark brown; legs and feet olive gray. *First winter:* Acquired by partial postjuvinal molt. Similar to adults in winter, but differs in upper wing-coverts which are retained from juvenal. Maxilla seal brown or slate black, base blackish slate; mandible fawn color or drab gray, but base whitish and tip slate black; tongue and inside of mouth drab gray; iris vandyke brown or prout brown; legs and feet buff or yellowish olive buff; claws black or brownish black. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but wing-coverts, scapulars, and upper tail-coverts conspicuously barred with pale buff and fuscous. Bill drab or brown, but mandible pale drab passing into purplish white or yellowish white at base; iris prout brown; legs and feet cream color or olive; claws black. *Natal:* Upper parts drab or light brownish gray, finely mottled with fuscous or dull black; narrow middle line on pileum and on back to rump black; very narrow loreal streak and postocular streak black; lower parts white. Mandible and edge of maxilla pale wax yellow; rest of bill black; iris dark brown; legs and feet light grayish olive.

MEASUREMENTS: *Adult male:* Wing, 88.9–104.9 (average, 100.6) mm.; tail, 45.0–53.1 (49.0); bill (exposed culmen), 21.6–25.4 (23.6); tarsus, 19.6–23.9 (22.4); middle toe without claw, 18.0–22.1 (19.3). *Adult female:* Wing, 100.1–109.0 (104.1); tail, 47.0–53.1 (50.3); bill, 21.6–24.9 (23.6); tarsus, 21.1–24.9 (22.9); middle toe, 18.0–21.1 (19.8).

RANGE: C. Mackenzie to c. Labrador, south locally to s. California and w. North Carolina. Winters from w. Washington, w. California, s. Texas, and South Carolina through Mexico and Central America to s. Brazil, rarely to Argentina; also West Indies.

TEXAS: *Breeding:* See species account. *Migration:* Collected north to Oldham (Aug. 19), east to Cooke, south to Calhoun (Aug. 11) and Cameron, west to Brewster and Hudspeth cos. Two specimens taken in east Texas (Houston and Nacogdoches cos.) have not been treated subspecifically. Common. *Winter:* No specimen (see species account).

NESTING: *Nest:* Singly, but sometimes in small colonies; on seashores, banks of rivers or lakes, in upland grassy fields or cultivated fields, often at a distance from water; usually in grass or high weeds; in depression in ground or mud; composed of bits of grass, moss, sedges, and seaweed; lined with grasses, weed stalks, or moss. *Eggs:* 3–5, usually 4; ovate; very slightly glossy; light clay color, light drab, or deep cream color; blotched and spotted with chocolate or blackish brown and pale gray; average size, 32.0 × 23.1 mm.

NORTHWESTERN SPOTTED SANDPIPER, *Actitis macularia rava* Burleigh

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Like *A. m. macularia*, but upper surface dark gray instead of grayish brown with little or no metallic sheen; spots of lower parts smaller, less numerous, and less intensely black.

MEASUREMENTS: *Adult male:* Wing, 96.0–106.0 (average, 103.1) mm.; tail, 42.0–52.0 (47.2); bill (exposed culmen), 21.5–23.5 (22.4). *Adult female:* Wing, 97.5–103.5 (101.5); tail, 49.0–53.5 (51.5); bill, 22.5–26.5 (25.0).

RANGE: N.w. Alaska to n.w. Mackenzie, south to s. Oregon and s. Idaho. Winters from Honduras to Venezuela and Peru.

TEXAS: *Migration*: Collected in Wilbarger (1 specimen), Cameron (1), Val Verde (1, Aug. 4), and Culberson (1) cos. Rare.

SOLITARY SANDPIPER, *Tringa solitaria* Wilson

SPECIES ACCOUNT

A rather small, freshwater sandpiper with white eye-ring; thin blackish bill; dark greenish legs. In flight, shows uniformly dark wing, rump; conspicuous white- and black-barred outer tail feathers. *Nuptial*: dark gray-brown above with whitish speckles; white below with narrow brown streaks on neck and sides of breast. *Winter*: dark grayish above with fewer spots; markings below reduced to faint brownish streaks or wash on sides. Length, 8½ in.; wingspan, 16½; weight, 2¼ oz.

RANGE: C. Alaska and n. Manitoba to c. Labrador, south to c. British Columbia, s. Manitoba, and s. Labrador. Winters chiefly from Mexico through Central America to Argentina; also West Indies.

TEXAS: (See map.) *Migration*: Late Mar. to mid-May; mid-July to early Oct. (extremes: Mar. 4, June 12; June 17, Nov. 30). Common to uncommon virtually throughout. *Winter*: Dec. 2 to Mar. 3. Uncommon in Rio Grande delta; scarce on and near central coast; rare and local in remainder of southern two-thirds; casual in northern third.

HAUNTS AND HABITS: Alone, rarely in twos or threes, the well-named Solitary Sandpiper haunts secluded woodland streams, ponds, bogs, and puddles which are often stagnant and sometimes skirted with grass and weeds. During migration, it also pauses about shores of lakes, rivers, cattle watering tanks, and sewage ponds,

at which time it may occur in loose groups. This reclusive bird breeds in muskeg of northern forests. Not until 1903 were its peculiar nesting habits confirmed. Low or high in a tree, it lays four eggs in an abandoned passerine nest; structures built by the Gray Jay, Robin, waxwings, or Rusty and Brewer's blackbirds are used, but cups constructed by other species will suffice. Linger in its favored retreats, the Solitary is a leisurely migrant throughout Texas; a few winter near the coast, but this freshwater bird avoids salt marshes.

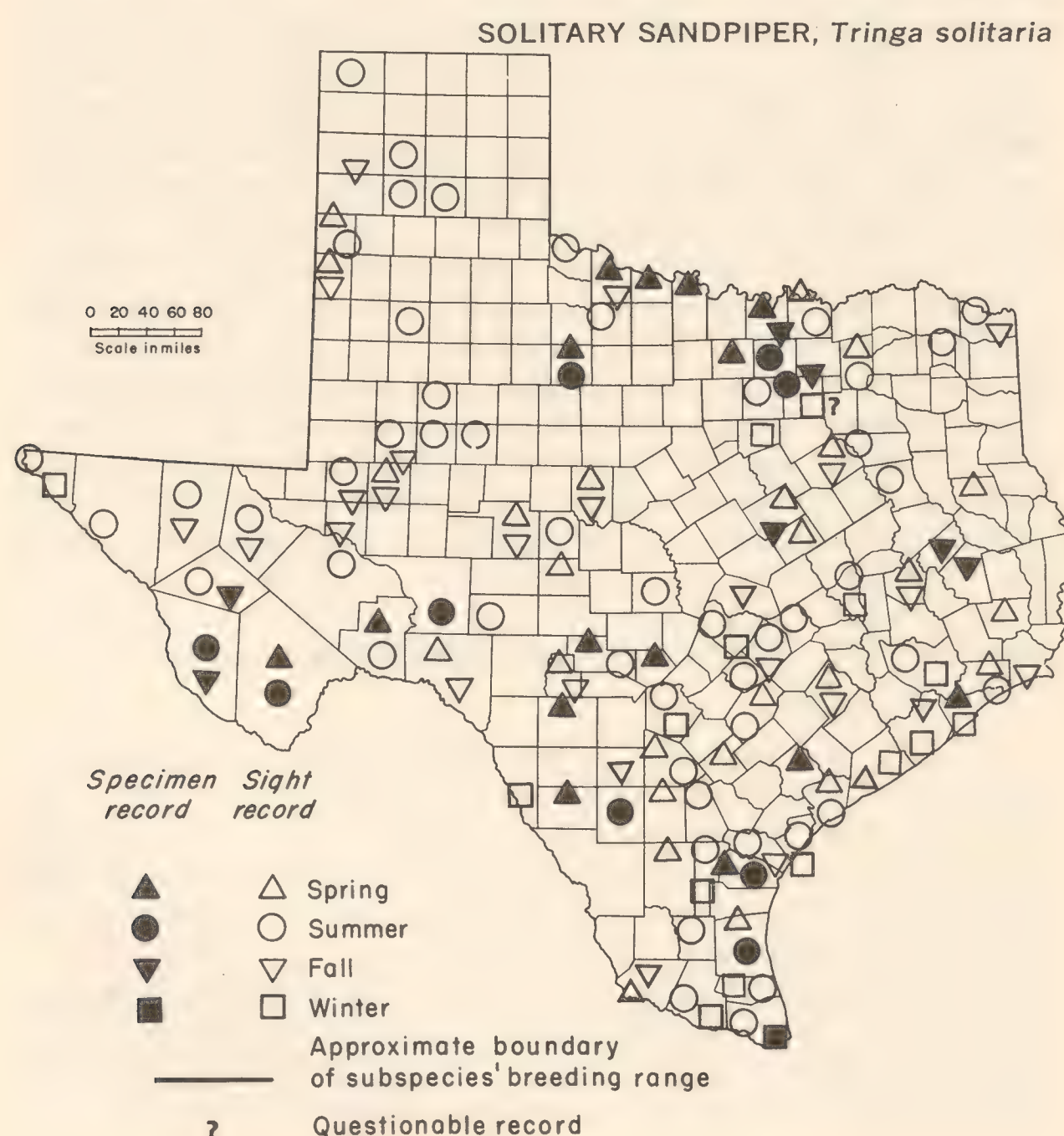
With swallowlike strokes of its dark wings, the bird is buoyant and graceful in the air; its flight is usually higher, swifter, and more zigzagging than that of the Spotted Sandpiper, the member of its family most likely to occur around freshwater ponds with the present species. When alighting, in the typical shorebird manner, it often lifts its wings high before folding them. Individuals walk deliberately on muddy banks as they pick up small mollusks and crustaceans, various insects and their larvae. A bird on the wing frequently snatches dragonflies, grasshoppers, and other flying insects in mid-air. As it wades in shallows, without clouding the water, the bird gently stirs the bottom with each step; this subtle action apparently coaxes aquatic insects to the surface where they are quickly devoured. Like many birds which feed at shoreline, the Solitary teeters, but its bobbing—more like that of a Lesser Yellowlegs (with which it sometimes associates, especially in fall)—is not so obviously tilting as is the Spotted Sandpiper's.

South of its northern breeding grounds, the chief vocalization of the Solitary Sandpiper is a sharp *peet-weet-weet!*, which is similar to that of the Spotted but higher and thinner. This is normally sounded in flight or when flushed.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN SOLITARY SANDPIPER, *Tringa solitaria solitaria* Wilson

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Upper parts, including wings and tail, fuscous or chaetura drab, with slight olive tinge, pileum narrowly streaked, remainder of upper surface with small, mostly roundish spots of white or buffy white; middle tail feathers spotted with white on outer webs, remainder broadly barred with white; primaries fuscous without light mottlings basally; secondaries like back; anterior lesser wing-coverts fuscous, remainder like back, also with a few small spots of white; stripe above lores white, more or less speckled with fuscous; sides of head and neck white and much streaked with fuscous; entire lower parts white, lower throat and jugulum much streaked with fuscous, sides barred with same, the latter slightly shaded with brownish; lining of wing chaetura drab mixed with white. Bill greenish brown or clove brown, darker or black terminally; tongue and inside of mouth clove brown; iris prout brown; legs and feet dark olive buff or olive green; claws brownish black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but above somewhat more grayish and less distinctly spotted with white; jugulum and upper breast less distinctly streaked, sometimes merely washed with hair brown. Bill black but basal portion, at least basal half of mandible, olive buff, raw umber, or dull olive yellow; iris vandyke brown; legs and feet olive green, dull olive yellow, olive buff, or olivaceous raw umber; claws black. *First nuptial*: Acquired by partial pre-



nuptial molt. Practically identical with nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but wing-coverts retained from juvenal; remainder of upper parts more numerous spotted, breast and neck less distinctly streaked. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter but lighter, and spots on upper surface more buffy and less distinct; sides and flanks even less distinctly streaked but washed with dull hair brown; sides only obscurely barred. Bill grayish olive, dark olive, olivaceous black, greenish olive, or clove brown, but base of mandible lighter, pale olive; iris vandyke brown; legs and feet yellowish olive buff, yellowish green, olive yellow, pale olive, dull olive green, olive gray, grayish olive green, or dull olive; claws brownish black.

MEASUREMENTS: *Adult male*: Wing, 121.4–129.5 (average, 126.5) mm.; tail, 50.0–56.9 (53.8); bill (exposed culmen), 26.9–30.5 (28.7); tarsus, 27.9–31.0 (29.7); middle toe without claw, 23.9–25.9 (24.6). *Adult female*: Wing, 125.7–134.1 (127.8); tail, 52.1–58.9 (55.3); bill, 27.9–32.0 (29.2); tarsus, 26.9–32.5 (29.2); middle toe, 23.9–25.9 (25.1).

RANGE: S.e. Yukon to n. Manitoba and c. Labrador, south to c. British Columbia, s. Manitoba, and s. Labrador. Winters locally from U.S. Gulf coast (a few), but chiefly through e. and s. Mexico and Central America to Argentina; also West Indies.

TEXAS: *Migration*: Collected north to Wichita, east to Trinity and Galveston, south to Cameron, west to Presidio (Aug. 8) cos. Fairly common. *Winter*: One specimen: Cameron Co., Brownsville (Jan. 23, 1928, Allan Brooks).

WESTERN SOLITARY SANDPIPER, *Tringa solitaria cinnamea* (Brewster)

DESCRIPTION: *Adults, nuptial plumage*: Similar to *T. s. solitaria* but larger, especially wing and tail; upper parts lighter, more grayish (less olivaceous), and usually less heavily white-spotted; outer primaries mottled on basal portion of inner webs with dull white; lores finely speckled instead of having definite white and dark streaks; light spots on back (particularly in juvenal) cinnamon or distinctly buffy instead of dull white.

MEASUREMENTS: *Adult male*: Wing, 124.0–136.9 (average, 132.3) mm.; tail, 52.6–58.9 (56.1); bill (exposed culmen), 27.4–32.0 (30.2); tarsus, 28.9–32.0 (30.2); middle toe without claw, 23.6–26.9 (24.9). *Adult female*: Wing, 136.9–142.0 (138.7); tail, 55.9–58.9 (57.7); bill, 28.9–32.0 (30.2); tarsus, 29.9–33.0 (31.8); middle toe, 23.9–24.9 (24.6).

RANGE: C. Alaska to e. Mackenzie, south to n.w. British Columbia and n.e. Manitoba. Winters from Colombia and Peru to Paraguay, c. Argentina, and Uruguay; casually in Baja California.

TEXAS: *Migration*: Collected north to Wilbarger, east to Polk, south to Cameron, west to Jeff Davis cos. Fairly common.

WILLET, *Catoptrophorus semipalmatus* (Gmelin)

SPECIES ACCOUNT

A large, heavy-bodied sandpiper with long (21½ in.), sturdy, blackish bill; bluish gray legs; in flight, flashes bold broad white stripe on largely blackish wing. *Nuptial*: vaguely blackish-mottled brownish gray above; white below with brown spots on neck and breast, bars of same color on sides and flanks. *Winter*: uniformly gray above; largely white below. Length, 14¾ in.; wingspan, 27¼; weight, 10¼ oz.

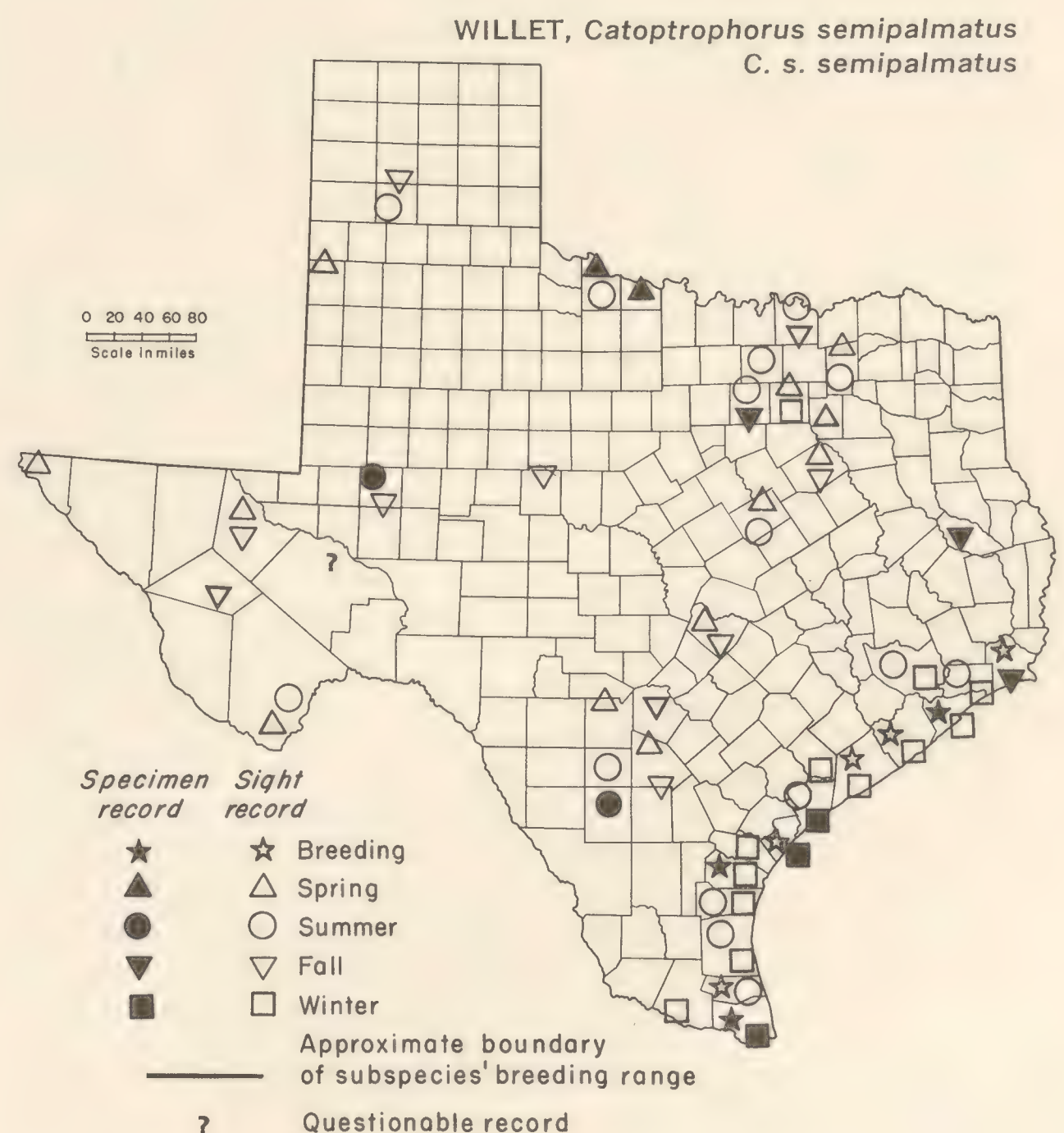
RANGE: C. Alberta to s. Manitoba, south to n.e. California and n. Colorado; near and on coasts of s. Nova Scotia, and locally along coasts from New Jersey to Florida and s. Texas, possibly Tamaulipas; also Bahamas and Greater Antilles. Winters coastally from n.

California to Galápagos Islands and Peru, and from Virginia and Texas to n. Brazil; also West Indies.

TEXAS: (See map.) *Breeding*: Late Mar. to late July (eggs, Apr. 3 to July 20) just above sea level. Common along Gulf coast. *Migration*: Late Mar. to mid-May; mid-July to mid-Sept. (extremes: Mar. 10, May 28; July 4, Oct. 20). Very common along coast; fairly common locally (mainly in spring) to scarce through interior. *Winter*: Oct. to Mar. Common to fairly common along coast.

HAUNTS AND HABITS: The Willet has the distinction of being the only species among Texas' twenty-four regular sandpipers which breeds enthusiastically within the Lone Star State. Here, pairs nest in Gulf salt marshes and dunes, tufted with beach grass and sea-oats, back from shoreline. Transients belonging to the large, pale, inland-breeding race, *C. s. inornatus*, pass over interior Texas, pausing where they find muddy banks along creeks, ditches, ponds, lakes, or rain pools; wintering birds move to broad flats beside the Gulf and its bays, lagunas, and estuaries. During the cool months *C. s. inornatus* joins those members of the coastal race, *C. s. semipalmatus*, which do not move south.

This large-bodied sandpiper appears heavy, gross, and dull—until it lifts its boldly patterned black-and-white wings. After a short run along a sandy or muddy shore, the bird launches into strong, direct, and somewhat ducklike flight. In feeding, the Willet walks quietly and deliberately about flats and in shallows as it picks up fiddlers, other minute crabs, mollusks, fish fry, small fish, insects, and worms. Inland, it forages in similar—only freshwater—haunts. Unlike most waders, the Willet perches at times on bushes, trees, fences, or even buildings.



This bird is exceedingly noisy, especially during the breeding season. Common notes include rapidly repeated *kip-kip-kip*'s; a loud *kay-ee* (the *ee* lower pitched), also described as *beat it*; and angry-sounding *wee-wee-wee*'s uttered in flight. In spring and summer, Willets frequently whistle rather musical *pill-o-will-o-willet*'s; sometimes this sounds more like *pill-will-willet*, etc.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN WILLET, *Catoptrophorus semipalmatus semipalmatus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts rather light brownish gray with slight olivaceous tinge posteriorly, pileum broadly streaked with fuscous, hindneck very narrowly streaked with same, back and scapulars with broad chaetura black or fuscous black spots, bars, or shaft streaks, these partly concealed by tips of feathers, tertials and scapulars barred on exposed webs with fuscous; rump hair brown with slightly paler edgings on feathers; upper tail-coverts white, longest feathers narrowly barred terminally with hair brown; tail mostly white, terminal half of middle feathers hair brown, obscurely barred with drab, terminal portion of rest mottled with drab; primary coverts and terminal part of primaries fuscous black, basal half of primaries white; outer secondaries chaetura black; remainder of secondaries mostly white; lining of wing chaetura drab, feathers tipped with white; supraloral stripe dull white, more or less mixed with fuscous; sides of head and of neck buffy white, the former narrowly, the latter broadly, streaked with fuscous or hair brown; lower parts white, throat broadly streaked with fuscous or hair brown, jugulum, upper breast, and sides barred more or less irregularly with same, lower tail-coverts narrowly and inconspicuously barred with hair brown or fuscous. Bill black or slate color, but base of mandible drab gray; iris prout brown; legs and feet deep gull gray, but edges of scales on front of tibia and tarsus tinged with chrome yellow; claws black or blackish slate. *Adults, winter:* Acquired by complete postnuptial molt. Upper surface of body, scapulars, and tertials plain brownish gray, without blackish markings; lower parts plain white with sides of neck and body, and sometimes jugulum, light brownish gray without conspicuous spots or bars. Bill light blue, darker toward end; iris brown; feet light blue. *First nuptial:* Acquired by wear from first winter, with which it agrees, except for lighter coloration due to fading. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but differs in retained, conspicuously buff-edged wing-coverts of juvenal. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but feathers of pileum, back, scapulars, tertials, and inner wing-coverts spotted or edged with buffy white or pale buff; jugulum and sides washed with buff and obscurely spotted and barred with hair brown or drab. Bill black; legs and feet gray. *Natal:* Upper parts grayish white or light brownish gray, irregularly mottled with dark brown; forehead plain dull white; loreal streak and two postocular streaks dark brown; sides of head and lower surface dull white.

MEASUREMENTS: *Adult male:* Wing, 182.1–196.1 (average, 186.7) mm.; tail, 67.1–74.4 (71.4); bill (exposed culmen), 52.1–58.9 (55.3); tarsus, 53.6–59.4 (57.7); height of bill at base, 9.4–10.9 (10.2); middle toe without claw, 31.0–33.5 (32.3). *Adult female:* Wing, 184.9–198.1 (188.7); tail, 71.9–75.9 (73.7); bill, 50.0–58.4 (55.3); height of bill, 9.9–12.2 (11.2); tarsus, 54.1–59.9 (57.7); middle toe, 30.5–35.1 (32.3).

RANGE: Near and on coasts of s. Nova Scotia, and coastally from New Jersey to Florida and Texas, possibly Tamaulipas; also Bahamas and Greater Antilles. Winters coastally from Virginia, Florida, and Texas to Central America (chiefly Caribbean slope) and n. Brazil; also West Indies.

TEXAS: *Resident:* Collected along coast northeast to Galveston (eggs), southwest to Cameron cos. Common.

NESTING: *Nest:* In sand dunes or on sandy beaches, along bays and inlets, in salt marshes, fields, even on quite dry land; slight hollow in ground, usually amid grass or other vegetation, or at base of small bush; composed of grass, rushes, small sticks, or other vegetation, though occasionally with no material at all. *Eggs:* 3–8, usually 4; ovate to ovate pyriform; very slightly glossy; light bluish gray, clay color, or olive buff; marked with olive brown, clove brown, or sepia, and faint shell markings of lavender or lavender gray; average size, 52.6 × 38.1 mm.

WESTERN WILLET, *Catoptrophorus semipalmatus inornatus* (Brewster)

DESCRIPTION: *Adults, nuptial plumage:* Similar to *C. s. semipalmatus* but much larger, particularly wing and bill; upper parts paler and less heavily marked with brownish black; anterior and lateral lower parts less heavily marked. Bill black, but its basal half, or basal half of mandible, drab or plumbeous; iris vandyke brown; legs and feet olive gray, dark olive gray, or plumbeous; claws black. *Adults, winter:* Similar to winter adults of *C. s. semipalmatus* but paler, particularly on upper parts. Bill slate black changing to gray at base; legs and feet light olive gray. *Juvenal:* Resembling juvenal *C. s. semipalmatus*, but upper surface lighter. Bill slate black, greenish plumbeous, or plumbeous at base, but terminally black or slate black; tongue white; iris hazel, seal brown, or hair brown; legs and feet greenish french gray, cinereous, or pale slate blue; claws brownish black or chaetura black.

MEASUREMENTS: *Adult male:* Wing, 196.6–208.0 (average, 203.2) mm.; tail, 77.7–82.6 (79.5); bill (exposed culmen), 55.1–62.5 (59.2); height of bill at base, 9.4–10.7 (10.2); tarsus, 61.0–70.6 (65.8); middle toe without claw, 32.0–35.6 (34.3). *Adult female:* Wing, 211.1–225.1 (217.2); tail, 80.0–87.6 (85.3); bill, 59.4–65.5 (62.2); height of bill, 9.9–11.9 (11.2); tarsus, 67.1–73.9 (70.1); middle toe, 32.0–36.1 (34.8).

RANGE: Locally from c. Alberta to s. Manitoba, south to n.e. California and n. Colorado. Winters coastally from n. California to Galápagos Islands and Peru, and from South Carolina, Florida, and Texas to Colombia; casually in West Indies.

TEXAS: *Migration:* Collected north to Wilbarger, east to Jefferson, south to Cameron, west to La Salle (Aug. 10) and Midland (summer) cos. Uncommon. *Winter:* Taken along coast northeast to Calhoun, southwest to Cameron cos. Uncommon.

GREATER YELLOWLEGS, *Glottis melanoleuca* (Gmelin)

SPECIES ACCOUNT

Totanus melanoleucus of A.O.U. check-list, 1957 (see Appendix A). Greater Yellowshank of British authors. A rather large, tall, long-necked sandpiper with long (21½ in.) black bill, very slightly upturned from base to tip; bright yellow legs. In flight, shows uniformly blackish wings; white rump; lightly brown-barred white tail. *Nuptial:* white-flecked brownish black above; white below with fine brownish streaks and spots on neck and breast, short bars of same color on sides and flanks. *Winter:* brownish gray above; markings below paler. Length, 13¾ in.; wingspan, 25; weight, 6¾ oz.

RANGE: S. Alaska, c. British Columbia, and s. Mackenzie to Labrador and Newfoundland. Winters from c. California, Texas, and s. South Carolina through Mexico and Central America to Tierra del Fuego; also West Indies.



Greater Yellowlegs, *Glottis melanoleuca*

TEXAS: (See map.) *Migration*: Early Mar. to mid-May; mid-July—occasionally early July—to mid-Nov. (extremes: early Feb., June 2; June 13, Dec. 3). Very common to uncommon virtually throughout. *Winter*: Late Nov. to late Feb. Very common locally to fairly common near coast; uncommon to scarce over most of interior.

HAUNTS AND HABITS: The Greater Yellowlegs is a wary and vociferous watchdog among shorebirds, whose loud ringing *wheu-wheu-wheu* usually signals an intruder in the vicinity of the breeding or feeding grounds. On upland tundra or marsh and muskeg of Alaskan and Canadian forests, this bird hollows its nest on a mossy hummock for its four brown-spotted orangish brown eggs. In Texas, especially during spring, this almost Willet-sized yellowlegs seeks rain pools, muddy banks of freshwater ponds, lakes, man-made impoundments, and sluggish streams for migration stops; on the Gulf coast, transients and wintering birds seem to prefer shores and shallows of salt marshes and tidal flats with standing water, rather than ocean beaches. The present species appears less gregarious than the Lesser Yellowlegs, but it does mingle more or less with other shorebirds.

Flight is swift, strong, and well sustained. The Greater, slender on the wing, flies with longish neck and bill straight out and yellow legs extended. A foraging Greater strides gracefully on flats or in shallows as it picks up small minnows, crustaceans, worms, and insects and their larvae off the ground or water's surface; rarely does it probe with its bill. Frequently it nimbly chases fish or insect prey in avocet fashion, with bill swinging from side to side as it skims the water. In water above leg-level it swims readily and buoyantly

with tail high. Wary or alarmed Greater are frequently observed bobbing, a curious and distinctive gesture of both yellowlegs species: An individual stands erect, raises then contracts the neck, and simultaneously lowers and lifts the tail as it peers about in a very alert manner.

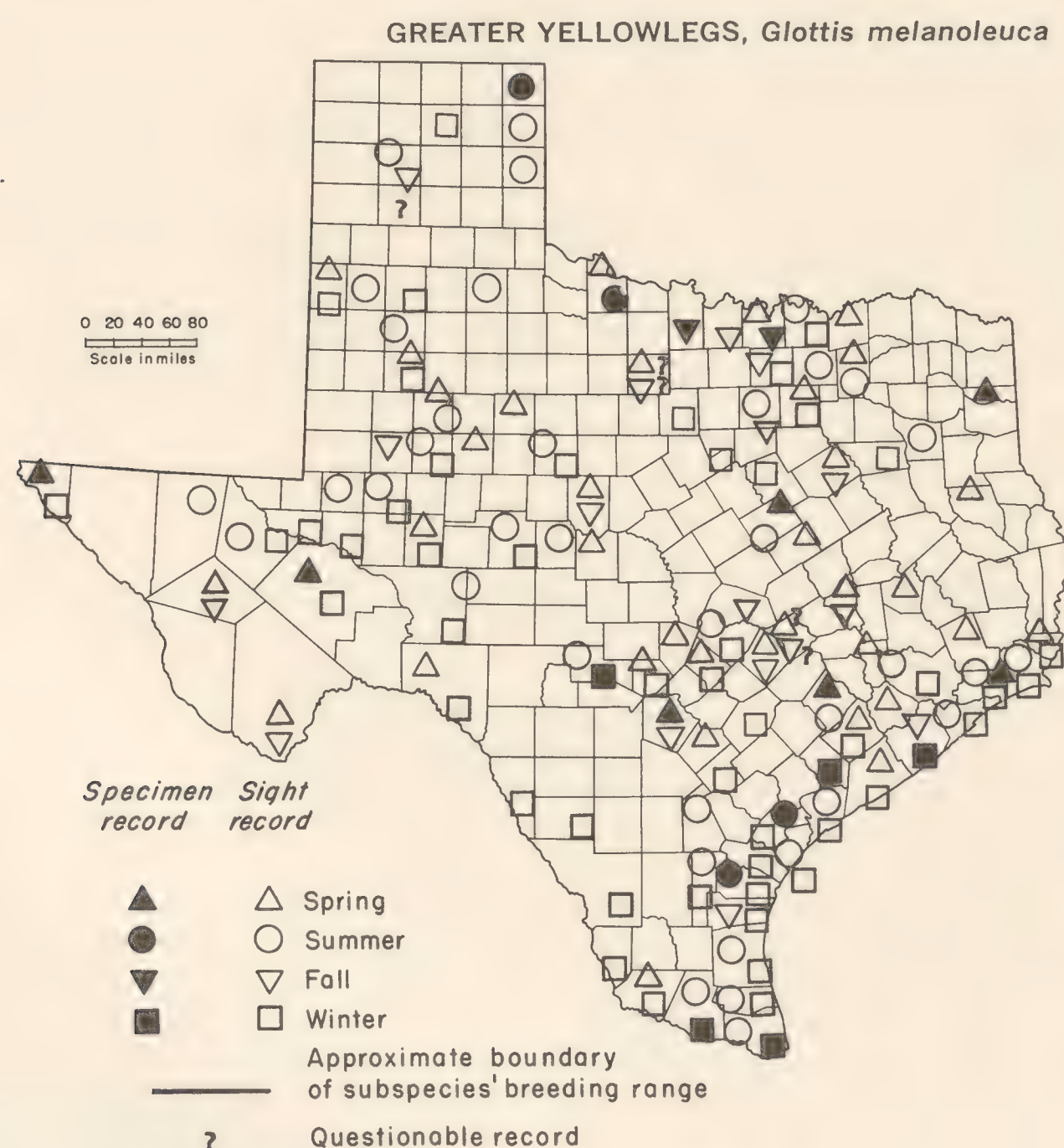
In addition to the Greater Yellowlegs' loud, clear, three or more *wheu's* of alarm, individuals yodel, usually in mid-air, a rapid rolling *whee-oodle, whee-oodle*, etc. The *wheu* (also described as *whew*) is heard frequently in Texas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Pileum and hindneck chaetura black, conspicuously streaked with white; remainder of upper surface black or fuscous black, mixed with fuscous and spotted with white, feathers of rump narrowly tipped with white; upper tail-coverts white, middle feathers and longest feathers narrowly barred with fuscous or hair brown; tail mostly hair brown or chaetura drab, middle feathers numerous barred with drab, remainder broadly barred with white; primaries fuscous, web of the outermost feather yellowish white, innermost feathers with some spots and mottlings of white or buffy white; secondaries hair brown, spotted on outer webs and barred on inner portion of inner webs with white; sides of head and neck dull white, much streaked with chaetura drab; eyelids white; lower parts white, throat much streaked with chaetura drab, jugulum and upper breast heavily barred or spotted with same, sides and flanks similarly barred, terminal portion of lower tail-coverts narrowly barred with same; lining of wing white, barred or mottled with hair brown. Bill black at tip, shading through slate black and blackish slate to plumbeous, olive, olive buff, olive gray, or isabella color at base; tongue white; iris vandyke brown; legs maize yellow, yellowish orange, cadmium yellow, deep chrome, or chrome yellow; feet saffron yellow, cadmium yellow, chrome yellow, or deep chrome; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but upper parts light brownish gray, streaked or spotted with white or dull white, but without black markings of nuptial; lower throat and jugulum more narrowly streaked; sides and flanks obscurely marked with hair brown or light gray. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but head and neck more narrowly streaked, feathers of back, scapulars, and upper surface of wings more uniformly mottled, being spotted, barred, or otherwise marked with dark sepia and grayish brown, and edged, tipped, and partially barred with white, grayish white, or gray; jugulum, breast, and flanks less barred. Bill with terminal half black, basal part olive buff; tongue and inside of mouth white; iris prout brown; legs and feet deep chrome; claws black. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but upper surface more grayish, feathers of back and scapulars edged with dull white. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but upper parts darker and more brownish, white spots more or less tinged with buff. Bill grayish olive or dull green, but tip black or blackish green; tongue white; legs and feet yellow or yellow ochre, but joints of toes dull brown.

MEASUREMENTS: *Adult male*: Wing, 180.1–198.7 (average, 187.7) mm.; tail, 71.1–83.1 (76.7); bill (exposed culmen), 50.0–59.4 (55.1); tarsus, 58.9–69.6 (62.5); middle toe without claw, 31.0–36.6 (33.5). *Adult female*: Wing, 184.9–205.0 (190.8); tail, 73.4–85.6 (77.5); bill, 50.5–62.0 (55.9); tarsus, 58.4–71.1 (63.2); middle toe, 31.0–38.4 (34.0).

TEXAS: *Migration*: Collected north to Lipscomb (June 30), east to Marion and Chambers, south to Cameron, west to Pecos and El Paso cos. *Winter*: Taken northwest to Kerr, east to Brazoria, south to Cameron and Hidalgo cos.



LESSER YELLOWLEGS, *Totanus flavipes* (Gmelin)

SPECIES ACCOUNT

Yellowshank of British authors. Practically identical to the larger Greater Yellowlegs, but is rather trimmer bodied and has a straight (not slightly upturned), short ($1\frac{1}{3}$ in.), slender, black bill. Whistle is one- or two-noted instead of three- or four-noted. Length, $10\frac{3}{4}$ in.; wingspan, $20\frac{1}{4}$; weight, $3\frac{1}{2}$ oz.

RANGE: N. central Alaska and s. Keewatin to n.w. Quebec, south to n. British Columbia and c. Quebec. Winters from Gulf states through lowland Mexico and Central America (rarely) to Strait of Magellan.

TEXAS: (See map.) *Migration*: Early Mar. to mid-May; early July—occasionally late June, especially along coast—to late Oct. (extremes: Feb. 8, June 2; June 13, Nov. 26). Very common to fairly common through most parts; scarce in southern Trans-Pecos. *Winter*: Early Nov. to late Feb. Very common locally to fairly common near coast; uncommon to scarce in most of remaining southern three-quarters; scarce to rare in northern quarter of state.

HAUNTS AND HABITS: The Lesser Yellowlegs, a Killdeer-sized edition of the Greater Yellowlegs, appears to be more numerous, or at least more gregarious, than its larger relative. In open boreal woodlands with sparse undergrowth—burned-over areas are particularly favored—the Lesser hollows its leaf-lined nest depression in the ground, usually not far from a marshy pond. A well-known migrant in Texas, the Lesser occurs throughout the state wherever it finds desirable watery habitat: within the interior, wet short-grass marshes, sandbars and shores of creeks, rivers, lakes,

and rain pools, also sewage ponds and other man-made impoundments; coastally, salt marshes and flats of Gulf bays and lagunas, especially those dotted with shallow pools left by tide or rain. Spring movement is largely inland; in fall transients are also common on coasts.

Lesser flight is very much like that of the Greater Yellowlegs, perhaps a bit more buoyant. Companies, usually loosely scattered, often include an assortment of other shorebirds. With steady, measured steps, the bird stalks flats and shallows where it energetically picks various insects, small crustaceans, tiny fish, and worms from water's surface or mud; seldom does it probe for food with its bill. Like the Greater, a suspicious or watchful Lesser stands very erectly and bobs head and tail as it carefully scans the surroundings.

Uttered typically on the wing, the Lesser's call is a whistled *yew* or *yew-yew* (also rendered *cu-cu*), noticeably less forceful than the corresponding three- or four-noted vocalization of the Greater Yellowlegs. Individuals in a flock converse with series of *kip*'s.

DETAILED ACCOUNT: NO SUBSPECIES

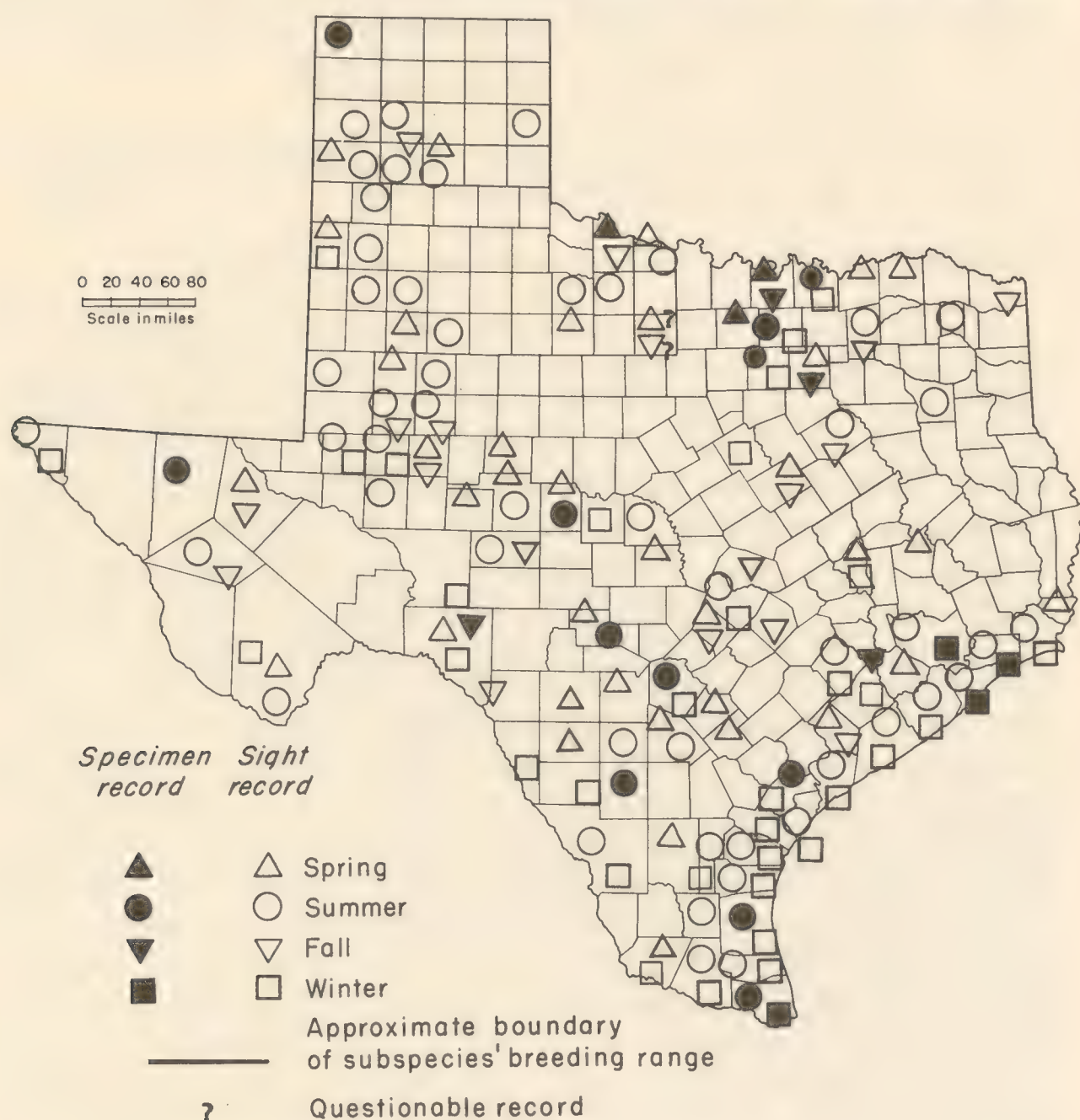
DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Similar to nuptial adults of Greater Yellowlegs, *Glottis melanoleuca*, but decidedly smaller; pileum averaging darker; anterior lower parts and sides of body more heavily barred; inner margins of primaries without fine mottlings of pale buff to white, but almost always plain brown. Bill black, but base of maxilla clove brown, of mandible raw umber; inside of mouth and base of tongue white; rest of tongue seal brown; iris prout brown or black; legs and feet cadmium yellow or dull yellowish green; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Differs from nuptial adults as do winter adults of *G. melanoleuca* from nuptial adults. *First nuptial*: Acquired by partial prenuptial molt. Differs from nuptial adults as does first nuptial *G. melanoleuca* from its nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but upper parts more grayish, feathers of mantle margined with dull white. Bill black, but base yellowish olive; inside of mouth and tongue white; iris seal brown; legs and feet chrome yellow. *Juvenal*: Acquired by complete post-natal molt. Similar to adults in winter, but upper parts darker and more brownish, white spots more or less tinged with buff. Bill terminally olive black passing into greenish olive at base; iris vandyke brown; legs and feet yellow, paler than in nuptial adults and mottled with brown; claws brown.

MEASUREMENTS: *Adult male*: Wing, 148.1–163.1 (average, 153.4) mm.; tail, 59.9–67.1 (63.0); bill (exposed culmen), 35.1–38.1 (36.3); tarsus, 45.5–55.6 (50.0); middle toe without claw, 26.9–32.0 (28.7). *Adult female*: Wing, 150.1–163.1 (155.7); tail, 55.9–66.0 (63.2); bill, 33.5–40.4 (36.8); tarsus, 46.5–55.9 (50.3); middle toe, 27.9–30.5 (28.7).

TEXAS: *Migration*: Collected north to Dallam (Aug. 3), east to Grayson and Chambers, south to Cameron, west to Val Verde and Culberson (Aug. 9) cos. *Winter*: Taken along coast north-east to Chambers, southwest to Cameron cos.

[SPOTTED REDSHANK, *Totanus erythropus* (Pallas)]

Tringa erythropus of British Handbook, 1944. A medium-sized, long-legged Old World sandpiper with long (2 in.) blackish bill, showing dull red at base of lower mandible. In flight, reveals white-flecked sec-

LESSER YELLOWLEGS, *Totanus flavipes*

ondaries and inner primaries; white lower back, rump; finely brown-barred white tail. *Nuptial*: white-spotted sooty black above; black below with narrow white bars on crissum; dark red legs. *Winter*: ashy brown above with broad white eye-stripe; largely white below; orange-red legs. Length, ca. 12 in.; weight, 5¾ oz.

RANGE: N. Scandinavia, n. Russia, and n. Siberia to Kamchatka Peninsula. Winters in Mediterranean and Black Sea regions and s. Asia through Africa. Recent collections in North America: Pribilofs, St. Paul Island (Sept. 19, 22, 1961); West Indies, Barbados (1965; identified by James Bond).

TEXAS: *Hypothetical*: One careful sighting: Aransas Co., mud flat beside Copano Bay near Rockport (1 on Apr. 16, 17, 1962, M. Owen Davies, Ruth P. Emery, Connie Hagar, Mr. and Mrs. P. B. Heywood, et al.).]

KNOT, *Calidris canutus* (Linnaeus)

SPECIES ACCOUNT

A medium-sized, stocky, short-necked sandpiper with rather short (1⅜ in.) black bill; short greenish black legs. In flight, shows narrow white wing-stripe and pale grayish upper tail-coverts. *Nuptial*: blackish-and cinnamon-mottled gray above; cinnamon on sides of head and across breast and belly; whitish crissum. *Winter*: gray above; white below with faint brownish streaks on sides of breast. Length, 10½ in.; wingspan, 20¾; weight, 5¼ oz.

RANGE: Locally in Arctic. Winters coastally, in Eastern Hemisphere between lat. 55° N. and 45° S.; in Western Hemisphere, chiefly from 35° N. to 55° S.

TEXAS: (See map.) *Migration*: Late Mar. to late May; late Aug. to early Nov.—a few locally to late Dec. (ex-

tremes: Feb. 10, June 16; July 1, Jan. 2). Common to fairly common along coast; rare to casual (most records in fall) through interior. May occasionally winter in small numbers locally along coast, but over-winter records lacking.

HAUNTS AND HABITS: The stocky Knot breeds widely on high inland arctic plains where it constructs a lichen-lined hollow amid rocks and sparse vegetation for its nest. The species, however, takes to coasts on its far passage to and from South America. In Texas, Knots feed, ordinarily in small groups, on sandy, shelly beaches and, to a lesser degree, on flats of bays and lagoons. A drive at surf's edge from Port Aransas to Corpus Christi in August usually flushes up a dozen or more parties of Knots. It is, in fact, something of a tradition among Texas bird watchers to go knotting down the beach when summertime is nearly over.

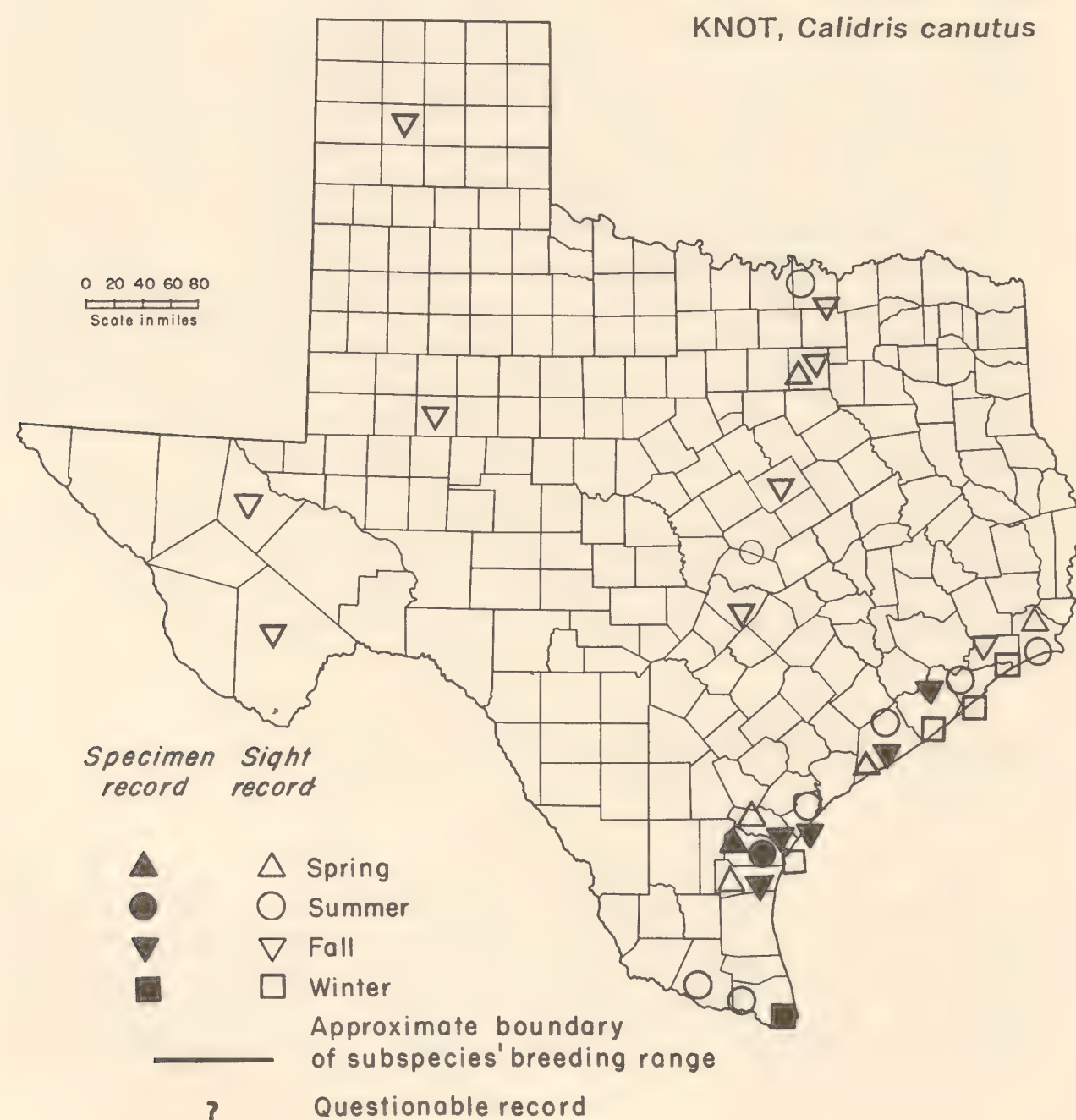
On the wing, this bird is swift and strong. In the vicinity of the breeding or feeding areas, it usually moves low over water or ground; migrants fly considerably higher in the air. Compact parties of Knots, performing aerial evolutions with typical sandpiper dexterity, are particularly beautiful during the breeding season when they flash gray backs, then red breasts, in their twisting-and-turning flight. More than most other shorebirds, Knots tend to cluster together as they feed. Usually rather deliberate in their actions, they pick at sand and seashells, much in the manner of Black-bellied Plovers, for small crustaceans and mollusks. In freshwater marshes and ponds on the breeding grounds, they probe muddy, sedgy, and grassy shores or wade breast-high in shallows in search of crustaceans, insects and their larvae, and various seeds. Resting birds move to marsh, shoal, or dune where, still in close-knit parties, they stand facing the breeze.

The two common notes of the Knot are a low croaky *knot* and a soft mellow *toot-wit* or *wah-quoit*. Migrants through Texas are usually silent.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN KNOT, *Calidris canutus rufa* (Wilson)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Upper surface mixed with light gray, cinnamon buff, cinnamon rufous, and dull black or chaetura black, these colors in varying proportions, crown and hindneck narrowly streaked, back broadly spotted or striped with blackish, these colors occupying central portions of feathers; rump hair brown, barred with chaetura black and dull white or buffy white, upper tail-coverts white, barred with chaetura black or dull black; tail plain light hair brown or drab, unbarred, shafts of feathers white except terminally; primaries fuscous or fuscous black, paler at base on inner webs; secondaries hair brown, paling on inner webs, shafts white with narrow tips dull white; tertials fuscous centrally, paler on edges; anterior lesser wing-coverts chaetura drab or chaetura black, much edged with dull white, remaining wing-coverts hair brown edged with pale buff or grayish white, greater series broadly tipped with white; sides of neck like hindneck; sides of head and lower parts to upper abdomen plain buffy cinnamon, vinaceous cinnamon, or mikado brown; lower abdomen and crissum white washed with color of upper abdomen; flanks and sides barred with hair brown or chaetura drab; some of lower tail-coverts barred or spotted with same; lining of wing white or buffy white with markings of hair



brown; posterior coverts plain pale drab; axillars white barred with hair brown. Bill black; iris dark hazel; feet black or greenish black. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but cinnamon of lower parts usually paler, lower abdomen more extensively white; upper parts with less admixture of cinnamon or cinnamon buff (more purely gray). Bill brownish black, but base of mandible olive; iris dark brown; legs and feet dark olive yellow; claws black. *Adult male and female, winter*: Acquired by complete postnuptial molt. Upper parts light brownish gray with slightly paler edgings, crown with shaft streaks of fuscous, and some other feathers similarly streaked; superciliary stripe white or dull white; cheeks and lower parts white, jugulum, lower throat, and sides barred or spotted with hair brown; other parts as in nuptial adults. *Male and female, second winter*: Acquired by complete postnuptial molt. Like adults in winter. *Male and female, first nuptial*: Acquired by partial prenuptial molt. Similar to corresponding nuptial adult, but differs in some worn feathers retained from first winter. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to adults in winter but differs in retention of juvenal scapulars and wing-coverts. Bill clove brown; inside of mouth slate color; tongue blackish slate; iris vandyke brown; legs and feet olive green; claws black. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but feathers of upper surface and upper wing-coverts narrowly edged with white and narrowly barred subterminally with fuscous or hair brown; white of lower surface ordinarily somewhat washed with buff. Bill dull slate, slate black, or greenish black, but more greenish at base and more blackish at tip; tongue black or dull bluish slate; legs olive, yellowish olive, or yellowish green.

MEASUREMENTS: *Adult male*: Wing, 151.9–168.9 (average, 161.8) mm.; tail, 59.9–66.0 (62.2); bill (exposed culmen), 32.0–36.6 (34.3); tarsus, 29.4–33.0 (30.7); middle toe without claw, 20.1–23.1 (21.4). *Adult female*: Wing, 154.9–176.0 (166.9); tail, 58.9–66.5 (62.7); bill, 34.0–38.1 (36.3); tarsus, 29.4–33.0 (31.8); middle toe, 20.6–23.6 (21.9).

RANGE: Melville and Somerset islands, south to n. Alaska, Victoria Island, and n.e. Keewatin. Winters coastally, chiefly from s. California to Peru, and from Buenos Aires to Tierra del Fuego; casually from Massachusetts and Florida to Texas.

TEXAS: *Migration*: Collected along coast northeast to Matagorda, southwest to Cameron cos. One early winter specimen: Cameron Co., s. Padre Island (Jan. 2, 1902, F. B. Armstrong).

PURPLE SANDPIPER, *Arquatella maritima* (Brünnich)

SPECIES ACCOUNT

Erolia maritima of A.O.U. check-list, 1957 (see Appendix A). A rather small, stout, dark sandpiper with yellow at base of thin blackish bill; short yellow legs. Flight frequently suggests that of Spotted Sandpiper. *Nuptial*: buff-streaked, purple-glossed dark brown above; white below with brown-streaked grayish breast. *Winter*: rather uniformly slate gray above and on breast; eye-ring and loreal spot white; white throat and belly. Length, 9 in.; wingspan, 15; weight, 3 oz.

RANGE: N. Ellesmere Island, Greenland, and Novaya Zemlya to New Siberian Islands, south to Southampton Island and n. Scandinavia. Winters coastally, chiefly from s.w. Greenland to Maryland, and from Iceland to shores of North, Baltic, and Mediterranean (rarely) seas.

TEXAS: *Winter*: Nov. 30 to Apr. 23. Casual on upper coast. No specimen, but two observations substantiated

with color photographs: Galveston Co., Galveston seawall (1 on Dec. 4, 5, 1953, found by R. O. Bentley, photographed by C. E. Hall; an enlarged color print of Hall's slide was identified positively by H. C. Oberholser as an excellent likeness of a Purple Sandpiper); Brazoria Co., Freeport jetties (1 observed, Dec. 28, 1968–Mar. 1, 1969, K. A. Arnold, V. L. Emanuel, Stevie Starr, et al.; documented with photograph by J. L. Tveten on cover of *Audubon Field Notes*, vol. 23 [1969], no. 3). Additional upper coast sight records, all from Galveston Co.: Bolivar (north) jetties (Apr. 23, 1970, V. L. Emanuel, Joe Farrell, T. B. Feltner, Noel Pettingell); Galveston (south) jetties (Mar. 29, 1971, T. B. Feltner, David DeSante, Art Wang, et al.); Galveston jetties (winter 1971–72, fide F. S. Webster, Jr.). Two unsubstantiated inland sightings: Denton Co., Lake Dallas (Mar. 29, 1955, Viola Hamilton); Smith Co., Lake Tyler (Apr. 23, 1954, B. B. Watson).

HAUNTS AND HABITS: The robust Purple Sandpiper breeds in arctic regions of the North Atlantic; its grass- and lichen-lined nest is hollowed on coastal tundra or placed on a desolate hillside or mountain slope somewhat removed from the sea. During the nonbreeding season, it—like its North Pacific counterpart, the Rock Sandpiper—nearly always allies itself to seaweed, wave-washed, rocky, bouldery shores; in Texas, where beaches are boulderless, man-made jetties simulate its favored habitat. Occasionally the Purple appears on a wrack-littered seashore, but almost never inland. A short migration takes it to winter quarters which rarely extend south of Cape May, New Jersey. At 39°01' north, Cape May seems to be its southernmost concentration point in America. Where numerous, small parties disperse to forage but convene at high tide to rest on rocks of upper beaches.

Flight, like that of other sandpipers, is swift and usually low over the shore; flocks also perform brief aerial evolutions. The Purple—all the time evading waves—energetically pries in rocky crevices and picks in seaweed and debris for small fish, shrimp and other crustaceans, mollusks, and marine insects; in the Arctic, it also takes buds, leaves, berries, seeds of various plants, and algae and moss. Sometimes it wades in shallows and, when necessary, swims readily. The Purple, as a rule, is notably tame; the two individuals photographed in Texas allowed close open approach.

Flocks of Purple Sandpipers twitter like swallows; a bird on taking flight sounds a *weet-wit* or *twit*. These vocalizations are occasionally heard south of the breeding area.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Upper surface black or dark brown, head and neck streaked with buff, back with purplish sheen and irregular buff markings; all but middle feathers of tail light brownish gray; upper wing-coverts dark brownish gray, greater series tipped with white; superciliary stripe grayish white; broad stripe below eyes grayish brown; lower parts white, breast grayish and, except for chin, mostly streaked with dark brown. Bill yellowish basally, dark brown terminally; iris dark brown; legs

and feet dull yellow. *Adults, winter*: Acquired by complete postnuptial molt. General color of upper parts light mouse gray, back and scapulars dull black with sheen of dull purple, and broad feather edgings of gray; dull white spot on lores; lower parts mostly white, except light brownish gray of lower throat and upper breast. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but gray tips and edges of lesser wing-coverts broader; a few other feathers retained from juvenal. *First winter*: Acquired by partial postjuvenal molt. Similar to adults in winter, but edgings of lesser wing-coverts broader and more clearly white (less grayish); also some other feathers retained from juvenal. *Juvenal*: Acquired by complete postnatal molt. Upper parts similar to those of nuptial adults, however with fewer and smaller ocher to tawny, but more white, markings; upper wing-coverts with edgings broader and more clearly white; sides of head and of neck plain mouse gray, with only indistinct streaks that lack definite buffy tinge; throat and jugulum darker and more uniform than adult, mouse gray to pale drab gray, sometimes intermixed with pale dull buff and with feather centers of hair brown to chaetura drab, these markings smaller than in adult; sides, flanks, and crissum much more narrowly streaked. Bill yellow basally, blackish or dark brown terminally; iris dark brown; legs and feet dull yellow.

TEXAS: *Winter*: See species account.

[SHARP-TAILED SANDPIPER, *Pisobia acuminata* (Horsfield)]

Erolia acuminata of A.O.U. check-list, 1957. Old World counterpart of Pectoral Sandpiper. *Nuptial adult*: resembles Pectoral, but russet (not blackish brown) above; blackish-dotted (not brown-streaked) cinnamon buff breast contrasts less sharply with white belly. In the hand, shaft of outermost primary only partly white, those of remaining primaries subterminally (not basally) white. *Winter adult*: more buffy above than winter Pectoral; markings below faded to pale gray buff breast-band with faint spots on sides; legs more greenish. *Immature*: resembles nuptial adult but has even more extensively cinnamon buff breast. Length, 9 in.; wingspan, 17; weight, 4 oz.

RANGE: Arctic coast of Siberia. Winters from New Guinea, New Caledonia, and Tonga Islands to Australia and New Zealand (rarely). In fall migrates on Pacific coast from Alaska and British Columbia to California (casually).

TEXAS: *Hypothetical*: One careful sighting: Galveston Co., near Galveston (Mar. 21, 1948, G. G. Williams, S. G. Williams).]

PECTORAL SANDPIPER, *Pisobia melanota* (Vieillot)

SPECIES ACCOUNT

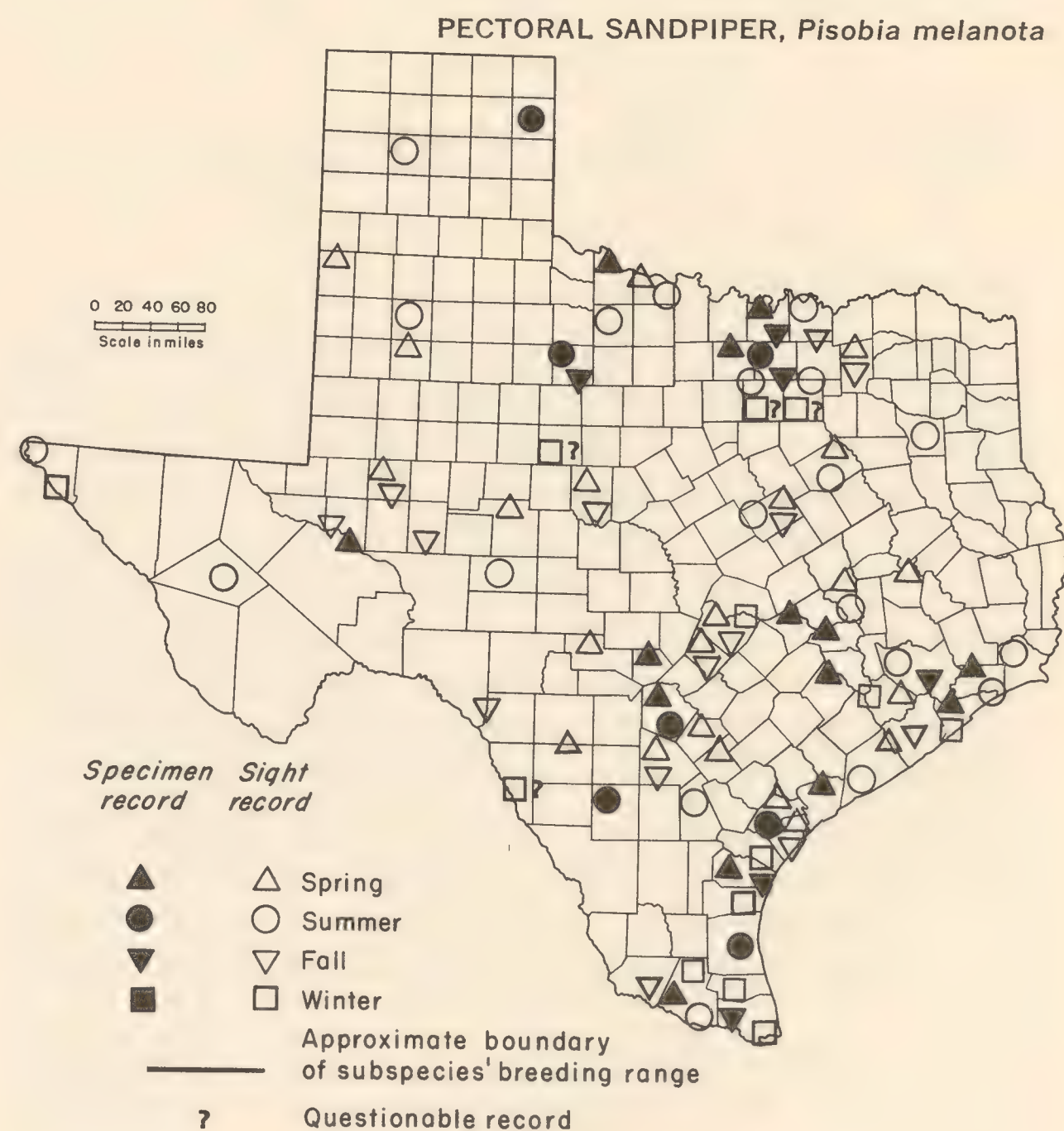
Erolia melanotos of A.O.U. check-list, 1957 (see Appendix A). A rather small, long-necked sandpiper with relatively short (11½ in.) bill, terminal half blackish, basally yellowish brown; dull yellow or greenish yellow legs; in flight, reveals uniformly dark wing with no or very faint wing-stripe. *Nuptial*: blackish- and buff-streaked brown above; heavily brown-streaked

bib terminating abruptly on breast contrasts sharply with white of remaining under parts. *Winter*: grayish above; bib retained but slightly faded. Length, 8¾ in.; wingspan, 17; weight, 3 oz.

RANGE: Arctic coasts and islands from n.e. Siberia and w. and n. Alaska to Victoria and Southampton islands, south along shores of Hudson Bay. Winters mainly from Peru and Bolivia to Chile and Patagonia.

TEXAS: (See map.) *Migration*: Early Mar. to late May; mid-July to mid-Nov. (extremes: Feb. 7, June 25; June 27, Jan. 2). Very common to common along coast; common to fairly common through interior eastern two-thirds; uncommon to scarce west to New Mexico border and Pecos River; rare and local (chiefly in fall) west of Pecos River.

HAUNTS AND HABITS: The Pectoral Sandpiper is so called because its throat and upper breast area is marked by a brown-streaked buffy bib; also, the male has pectoral air sacs which he inflates on the arctic breeding grounds until he is very round chested indeed. Colloquially called "little grass snipe," this bird prefers wet, short-grass meadows and grassy pools—the same habitat frequented by the somewhat similar Common Snipe, which bird, however, possesses a much longer bill. The present species nests on rolling tundra or dry grassy flats near shores; a depression lined with crisp stems and leaves is well concealed usually in bunches of grass. In Texas, migrants on their way to or from South America seek meadows, also rain pools, grassy or sedgy shores of lakes and rivers, and even rather dry rough pastures; on the Gulf coast, this species is to be looked for in the farthest reaches of fresh or brackish marshes back from the surf. Pectorals become increasingly uncommon west of the hundredth meridian. Normally this bird is seen singly or in small



companies, although at times it collects, especially where water is concentrated, with Least, Semipalmated, Dunlin, and other small sandpipers.

Flight near the ground is usually erratic and not prolonged; once on the wing the bird is strong, swift, and direct. Aerial parties of Pectorals are compact and synchronized in their movements. After landing, individuals usually scatter to feed. Although largely insectivorous, it also eats a few earthworms, crustaceans, and seeds. Feeding with rapid thrusts of the bill, this sandpiper walks slowly and often stops, extends its head, and stands motionless and erect in a very vigilant manner. If startled by an intruder, the snipelike Pectoral freezes and crouches; only if about to be stepped on, does it flush in zigzag flight.

Pectorals are noisy sandpipers, particularly on the breeding ground. The flight and flush note is a reedy *kerr*; *krik krik*; or *trip-trrip*. The inflated air sacs of a nuptial male emit tremulous, resonant sounds like those produced by blowing across the top of an empty bottle.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper surface dull black or fuscous black, feathers much edged and tipped with cinnamon, cinnamon buff, dull cinnamon, and dull pale buff, these markings almost obscuring central dark shaft streaks on hindneck, thus giving neck a lighter appearance than rest of upper parts, rump and middle upper tail-coverts almost uniform with very inconspicuous edgings of pale buff or cinnamon, lateral upper tail-coverts white with hair brown shaft streaks; middle tail feathers fuscous black, remainder plain light hair brown or drab, with narrow dull white tips; primaries fuscous, paler on inner webs, shaft of outermost feather yellowish or brownish white; secondaries hair brown, paler on inner webs, and narrowly tipped with white, these tips most evident on inner secondaries; tertials and scapulars fuscous, edged with brownish white or dull cinnamon buff; wing-coverts dark hair brown, edged with dull white or dull buff, and paler on margins; superciliary stripe white but somewhat spotted or streaked with fuscous; loreal streak fuscous, and auricular patch cinnamon; otherwise sides of head and neck white or buffy white, narrowly and often obscurely streaked with fuscous or hair brown; chin white; throat and jugulum drab, streaked with hair brown or fuscous; remainder of lower parts white; lining of wing white, outer edge more or less mixed with hair brown. Bill black, greenish black, or slate black, but basal half raw umber, burnt umber, isabella color, dull greenish yellow, olive green, tawny olive, yellowish tawny olive, or dull orange; tongue white or drab gray; bare space on chin yellowish tawny olive; iris prout brown or vandyke brown; legs and feet dull yellow, yellowish tawny olive, olive yellow, greenish gray, or yellowish green; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but lacking cinnamon markings on posterior upper parts, and blackish markings more blended. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but with some of tertials, wing-coverts, and scapulars, together with back and rump, retained from first winter. *First winter:* Acquired by wear from juvenal, with which it is identical except for more or less paleness due to wear and fading. Bill terminally black, basally raw umber, prout brown, or tawny olive; iris vandyke brown. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but outer feathers of back and scapulars margined with white; breast and jugulum much more heavily tinged with buff, and fuscous markings narrower and less sharply defined. Legs and feet lighter or more yellowish than in adults.

MEASUREMENTS: *Adult male:* Wing, 135.1–146.0 (average, 140.0) mm.; tail, 58.9–65.0 (62.2); bill (exposed culmen), 25.9–29.4 (28.2); tarsus, 26.9–29.9 (27.7); middle toe without claw, 21.6–24.4 (23.6). *Adult female:* Wing, 119.6–130.0 (125.7); tail, 51.1–59.9 (55.3); bill, 23.9–28.9 (25.7); tarsus, 23.9–26.4 (25.7); middle toe, 21.1–23.9 (22.6).

TEXAS: *Migration:* Collected north to Hemphill (July 13), east to Cooke and Chambers, south to Cameron, west to La Salle (Aug. 24) and Pecos cos.

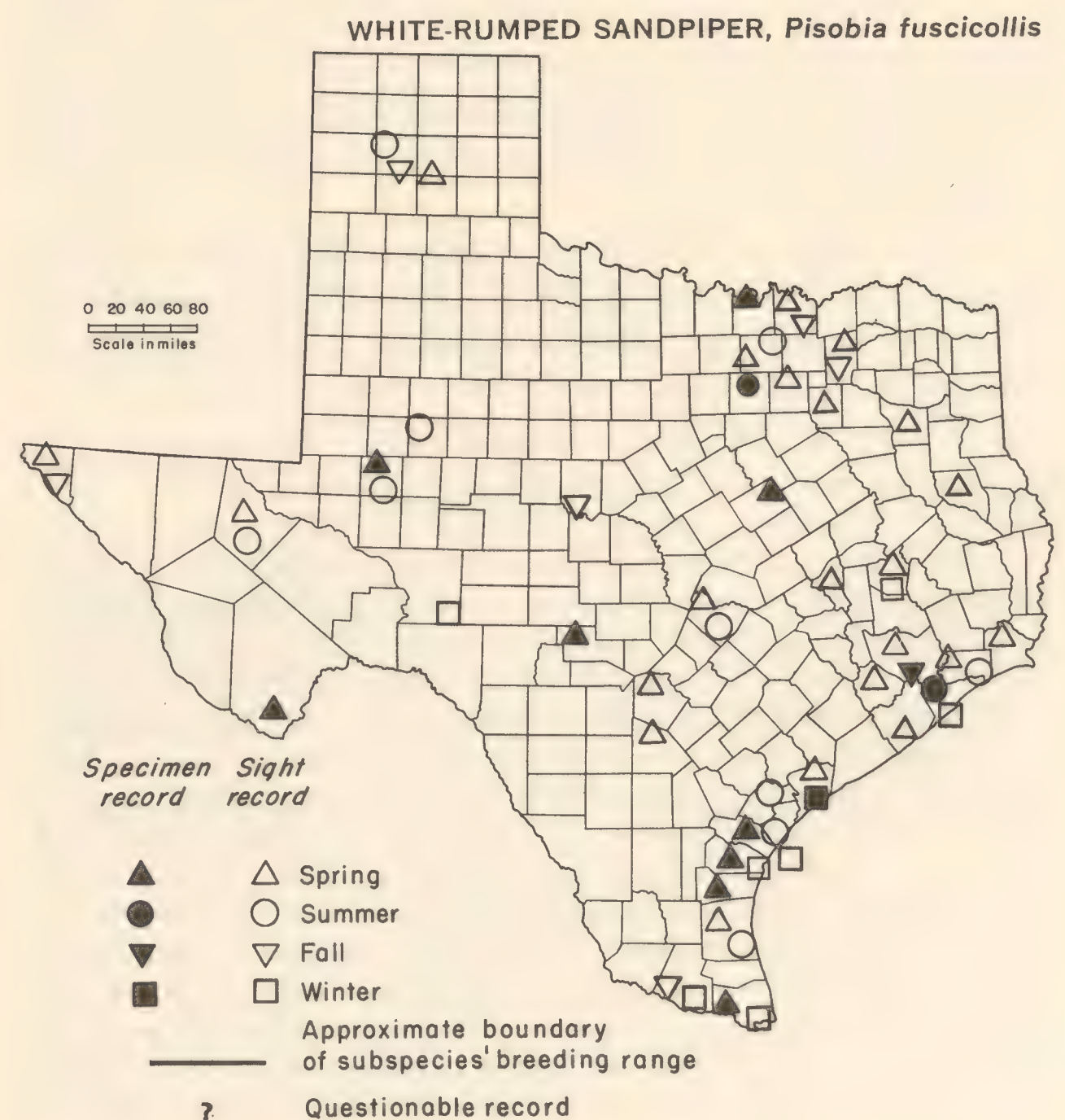
WHITE-RUMPED SANDPIPER, *Pisobia fuscicollis* (Vieillot)

SPECIES ACCOUNT

Erolia fuscicollis of A.O.U. check-list, 1957 (see Appendix A). Also known as Bonaparte's Sandpiper. A large peep with medium-length (1 in.) bill; dusky legs; folded wing extends slightly beyond tail; in flight, reveals solid white at base of blackish tail (other peeps display blackish median stripe through this white area). *Nuptial:* resembles Baird's, but has streaked (not scaly) brownish back; finely brown-streaked whitish (not buffy) on sides of head; whitish (not buffy) breast with brown spots and streaks. *Winter:* grayish above; white below with scanty breast markings. Length, 7½ in.; wingspan, 15; weight, 1½ oz.

RANGE: Melville Island and n. Baffin Island, south to n.e. Alaska (rarely), n. Mackenzie, and s.w. Baffin Island. Winters chiefly from Paraguay and s. Brazil to Tierra del Fuego and Falkland Islands.

TEXAS: (See map.) *Migration:* Late Apr. to early June; late July to late Nov. (extremes: Apr. 11, July 5; mid-July, Jan. 2). Very common to fairly common in spring along coast; common locally to uncommon through remainder of eastern half; uncommon through



much of western half, though largely absent from extreme southwestern portion; rare at El Paso. Scarce to rare in fall. *Winter*: One specimen: Calhoun Co., Indianola (Feb. 10, 1885, D. H. Talbot). Two sightings: Galveston Co., west end of Galveston Island (5 on Feb. 3, 1932, H. C. Oberholser); Hidalgo Co., Mission (1 on Feb. 12, 1939, A. T. Hale, Jr.).

HAUNTS AND HABITS: The White-rumped Sandpiper is the first of five peeps—others are Baird's, Least, Semipalmated, and Western sandpipers. All these tiny shorebirds resemble each other closely and they flush with *peep*-like notes. On its far northern breeding grounds, the White-rumped Sandpiper usually hollows its shallow nest on or beside a tussock of grass or moss and then lines it with dead leaves. Reportedly abundant in the Arctic, as well as in winter on pampas and coasts of South America, it is perplexing why this peep is so rarely seen in most parts of the United States. One explanation may be that the Whiterump migrates through the United States so late in spring that many bird watchers have retired their binoculars until fall migration! The only flights of any size occur across the Great Plains in spring, and on and off the North Atlantic coast as far out as Bermuda in fall. Migrants in Texas appear inland on muddy shores of shallow lakes, sewage ponds, sandbars of rivers, rain pools, damp meadows, and stubble fields; coastally, birds prefer flats of bays and lagoons large enough to be affected by tides.

Flight is swift and strong, at times undulating. A few Whiterumps frequently feed with other sandpiper species on flats where they probe for small crustaceans, mollusks, marine worms, insects, and their larvae. It also wades in shallows—up to its belly at times—and often completely submerges its head. Usually slow and methodical, this peep works one spot with deep thrusts of the bill. In August, masses of Whiterumps gather about marsh pools to eat insects; individuals often have a fatty layer one-fourth inch thick over the entire body, which will be fuel for the long intercontinental migration.

Flight note of the White-rumped Sandpiper is diagnostic: a short, sharp, batlike *tzeet*, which sounds like two marbles being struck together. In spring, flocks twitter like swallows.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Pileum fuscous, more or less broadly streaked with dull cinnamon buff, forehead mostly grayish white mixed with buff; hindneck grayish white, buffy white, or dull pale buff, finely streaked with fuscous; back and scapulars dull black or fuscous black edged and tipped with cinnamon, tawny, light buff, and dull brownish white; rump chaetura drab, tips of feathers dull mouse gray; upper tail-coverts white with a few streaks of chaetura drab or hair brown; middle feathers of tail fuscous black, remainder of tail plain hair brown or drab, feathers very narrowly tipped with white; primaries fuscous or fuscous black, paler on inner webs, shafts mostly whitish; secondaries hair brown, paler on inner webs, becoming white basally on innermost, all feathers narrowly tipped with white; upper wing-coverts fuscous with broad edgings of light grayish

drab; superciliary stripe dull white, somewhat mixed with fuscous; loreal line and postocular stripe dull hair brown, posteriorly washed with cinnamon and slightly mixed with whitish; sides of neck like hindneck; cheeks dull white, very narrowly streaked with hair brown or fuscous; chin white, unmarked; throat and jugulum grayish white, slightly washed with buff, spotted and obscurely streaked with hair brown and fuscous; remainder of lower parts white, sides and flanks irregularly barred or spotted with fuscous and hair brown, and slightly washed with buff; lining of wing white, outermost feathers mottled with drab. Bill black, becoming flesh color, dull greenish brown, sepia, yellowish brown, seal brown, or fawn at base, at least on mandible; tongue white or cinnamon; iris vandyke brown; legs and feet clove brown, seal brown, black, fawn, greenish black, or dark olive brown; claws black. *Adults, winter*: Acquired by prolonged complete postnuptial molt (that of wing-quills delayed). Somewhat similar to nuptial adults, but most of upper parts hair brown or rufescent hair brown, feathers slightly streaked with fuscous, markings of throat and jugulum smaller, much duller, and much more blended. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but many feathers of back and scapulars more or less edged with buff or tawny; wing-coverts like those of juvenile. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but feathers of back and scapulars tipped with white and edged with tawny or russet, as are feathers of pileum, rump, and tertials, also wing-coverts edged with pale buff; breast and jugulum tinged with buff or dull cinnamon.

MEASUREMENTS: *Adult male*: Wing, 117.1–122.5 (average, 119.6) mm.; tail, 50.0–53.1 (51.3); bill (exposed culmen), 21.1–23.9 (22.9); tarsus, 22.1–23.9 (23.4); middle toe without claw, 18.0–21.1 (19.3). *Adult female*: Wing, 116.6–124.0 (120.6); tail, 50.0–54.1 (51.1); bill, 21.1–25.9 (23.4); tarsus, 22.1–23.9 (22.9); middle toe, 19.0–21.6 (20.3).

TEXAS: *Migration*: Collected north to Cooke, east to Galveston (June 5), south to Cameron, west to Brewster and Midland cos. *Winter*: One specimen (see species account).

BAIRD'S SANDPIPER, *Pisobia bairdii* (Coues)

SPECIES ACCOUNT

Erolia bairdii of A.O.U. check-list, 1957 (see Appendix A). A large peep with medium-length ($\frac{7}{8}$ in.) thin bill; folded wing extends beyond tail; in flight, shows blackish primaries in contrast to brown secondaries. At all seasons, buffier above and on breast than other peeps; has scaly (not streaked) back; buffy sides of neck and breast; black legs. Length, $7\frac{1}{2}$ in.; wingspan, $15\frac{1}{4}$; weight, 2 oz.

RANGE: Arctic coasts and islands from n.e. Siberia and n. Victoria Island to n.w. Greenland, south to c. western Alaska, Boothia Peninsula, and Baffin Island. Winters from n. Ecuador to Chile and w. Argentina.

TEXAS: (See map.) *Migration*: Mid-Mar. to late May; mid-July to late Oct.—a few to late Nov. (extremes: Mar. 6, June 7; June 24, Jan. 8). Very common locally to fairly common through most of western three-quarters, but scarce in southern Trans-Pecos; scarce to rare through eastern quarter.

HAUNTS AND HABITS: The Baird's is—though certainly not exclusively—somewhat of a mountain sandpiper, especially in winter when it retreats to twelve thousand feet and higher in the South American Andes; in mi-

gration, many individuals pass through comparable altitudes in the Rockies. An arctic breeder, it usually conceals its nest—the standard sandpiper scrape in the ground—under a grass tuft on a mossy tundra ridge or rocky mountain slope. This species is rather few in number compared to other peeps, and in Texas, although widespread, is often overlooked. Favored inland stopping spots are irrigated or rain-moistened fields, sewage evaporation ponds, river sandbars, and playa flats, although the bird is found as well in grassy uplands far from water. On the Gulf coast it prefers upper portions of beaches or slightly damp margins of ponds back from the surf. Ordinarily, during migration, the bird is seen singly or in small companies.

In flight and behavior, the Baird's is basically similar to other little sandpipers. It occurs in flights with other peeps, but upon alighting, the present species generally separates to feed alone. With stops and starts, it runs about the drier tracts of flats—freshwater or salt—picking up small crustaceans, mosquitoes, grasshoppers, and other insects. Probing in muddy ground, wading in shallows, and chasing waves it leaves to its kin.

Kreep or *kree* is the usual call note of the Baird's Sandpiper.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum and hindneck fuscous or fuscous black, much streaked with buffy white or light buff, forehead dull buffy white or light gray; back and scapulars fuscous black, back narrowly margined and tipped with pale dull buff or dull white, scapulars broadly tipped and margined with same and some cinnamon buff; rump and upper tail-coverts fuscous, feathers of rump narrowly margined with pale dull buff; lateral upper tail-coverts drab, margined and mottled with dull white, middle

upper tail-coverts fuscous or fuscous black with paler edgings; middle tail feathers fuscous, remainder plain drab; primaries fuscous, paler on inner webs, middle portion of shafts much paler, shaft of outermost feather yellowish white; secondaries hair brown, paler on inner webs; tertials fuscous margined with paler; lesser wing-coverts fuscous, narrowly and inconspicuously margined with buffy white; remainder of wing-coverts hair brown, greater series inconspicuously tipped with dull buffy white; rather inconspicuous superciliary stripe buffy white mixed with fine streaks and spots of fuscous; loreal stripe of light fuscous mixed with light grayish; rest of sides of head pale dull buff, much streaked narrowly with fuscous or hair brown; sides of neck like hindneck; chin buffy white; lower throat and jugulum dull buff, washed with gray and with fine shaft streaks and small spots of hair brown or fuscous; remainder of lower parts white; lining of wing white, outer feathers mottled with light hair brown or drab, posterior coverts drab. Bill black, base somewhat brownish; inside of mouth and tongue blackish slate; iris vandyke dark brown; legs and feet black, grayish black, or slate black. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts lighter, duller, and more uniform than in nuptial adults, this because ground color is dull cinnamon buff or drab with shaft markings of fuscous or fuscous black; jugulum and breast much more strongly tinged with dull buff and less broadly streaked. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but may be distinguished by scapulars, tertials, and wing-coverts retained from juvenal. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but hindneck more strongly suffused with cinnamon, back and scapulars conspicuously tipped with dull white, imparting scalelike appearance; jugulum more strongly tinged with dull buff, and with much less sharply defined markings of hair brown or fuscous. Bill black; iris vandyke brown; legs and feet dark clove brown or dark olive; claws black.

MEASUREMENTS: *Adult male:* Wing, 114.0–121.9 (average, 118.9) mm.; tail, 48.0–53.1 (51.3); bill (exposed culmen), 20.6–23.1 (21.9); tarsus, 20.1–23.1 (21.4); middle toe without claw, 16.0–18.0 (17.3). *Adult female:* Wing, 119.1–126.0 (122.2); tail, 49.0–54.1 (51.8); bill, 21.6–23.9 (22.9); tarsus, 20.1–23.1 (21.4); middle toe, 16.5–19.0 (17.3).

TEXAS: *Migration:* Collected north to Wichita, east to Polk and Harris, south to Cameron, west to Brewster and Hudspeth cos.

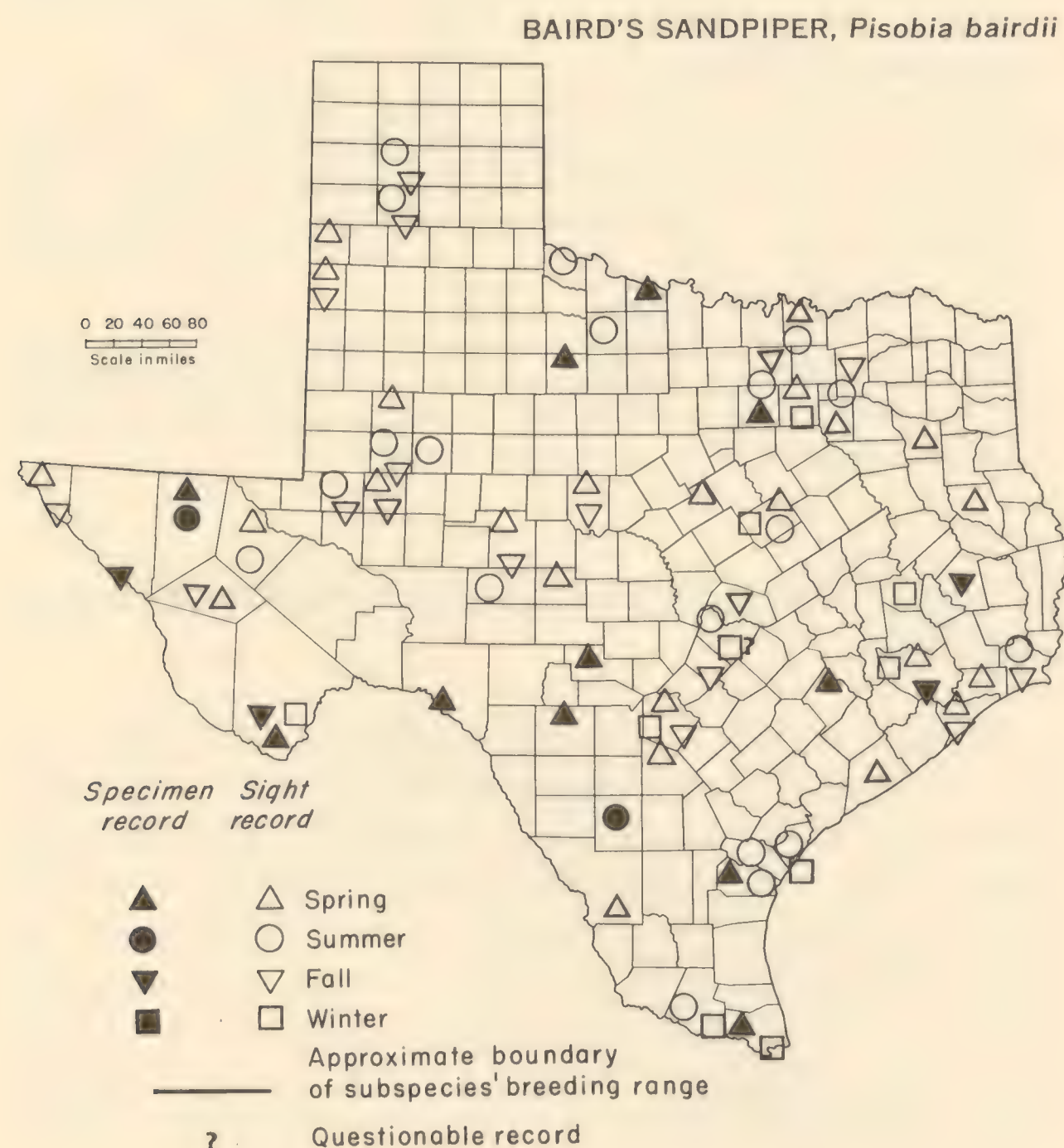
LEAST SANDPIPER, *Pisobia minutilla* (Vieillot)

SPECIES ACCOUNT

Erolia minutilla of A.O.U. check-list, 1957 (see Appendix A). American Stint of British authors. Smallest U.S. sandpiper; separated from other peeps by yellowish or greenish (not blackish) legs and short ($\frac{3}{4}$ in.) thin bill. Winter adult is browner above and on breast than other peeps. Length, 6 in.; wingspan, $11\frac{1}{2}$; weight, $\frac{3}{4}$ oz.

RANGE: W. Alaska to n. Labrador, south to s. Yukon, n.e. Manitoba, and Newfoundland; also Sable Island off Nova Scotia. Winters mainly from Oregon, California, Texas, and North Carolina through Mexico and Central America to Peru and c. Brazil; also Galápagos Islands and West Indies.

TEXAS: (See map.) *Migration:* Mid-Mar. to mid-May; mid-July to mid-Nov. (extremes: Mar. 5, June 26; July 1, Dec.). Very common to fairly common virtually throughout. *Winter:* Nov. to late Mar. Very common locally to common along coast; common to uncommon

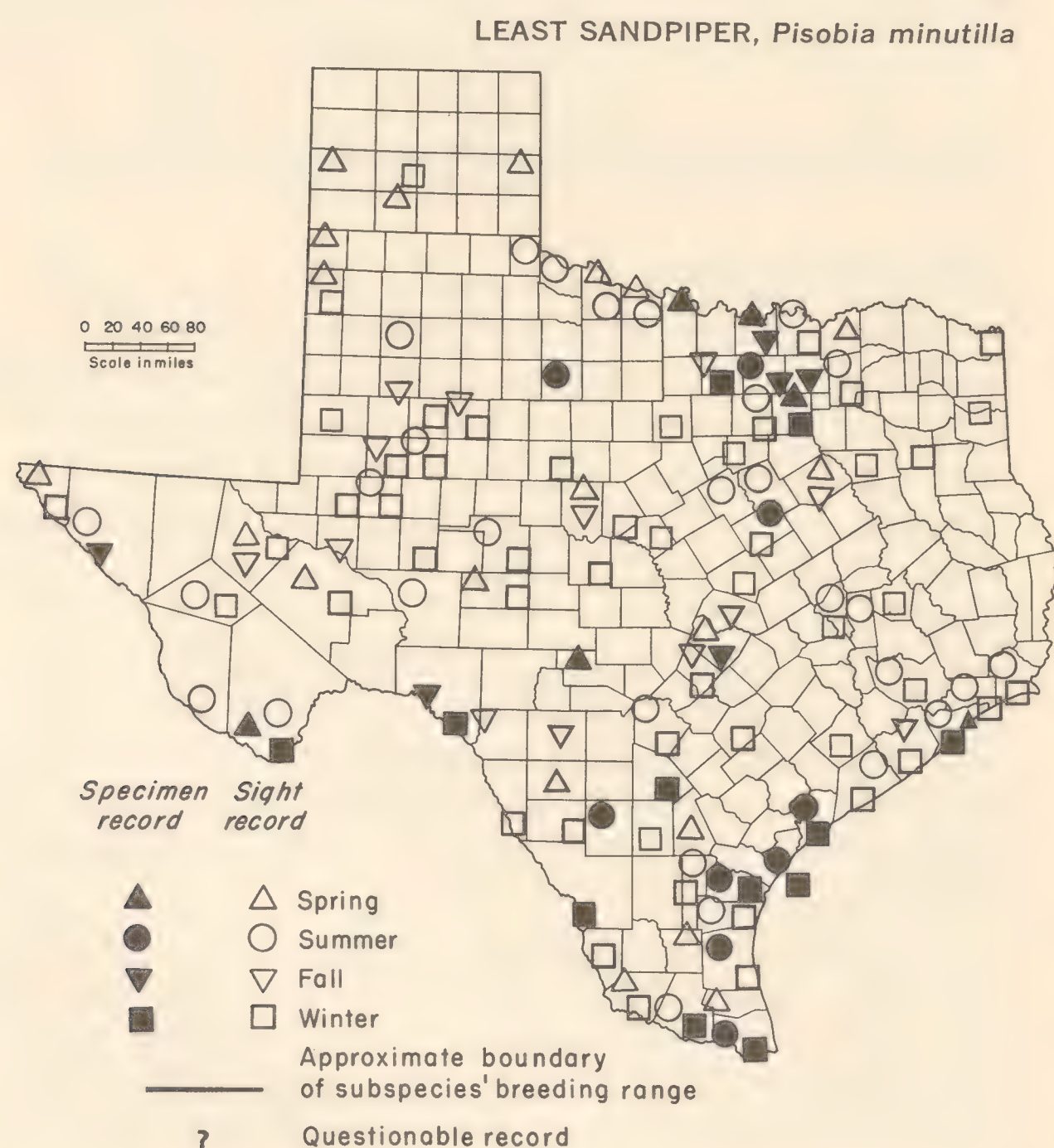


through most of interior; scarce in northern Panhandle.

HAUNTS AND HABITS: The Least Sandpiper is the tiniest North American member of its family, but it is only a fraction smaller than its cousin, the Semipalmated Sandpiper. Marshy bogs in subarctic forests of spruce and fir are breeding grounds for the Least. Its nest is a shallow hollow in grass or moss on a knoll or hummock lined with dry grass and leaves. Companies of Leasts migrating through Texas stop over on river bars, muddy shores of rain pools, ponds, and lakes, and even in dry pastures. As a general—though fallible—rule, on the Gulf coast this species winters primarily on estuary, bay, and marsh flats, rather than on surfside beaches which are more likely to be frequented by the Semipalmated Sandpiper. Inland, Leasts winter where they find grassy, marshy creeks or other wet, muddy places. Extremely gregarious, this bird often flocks in considerable numbers with other peeps, sometimes with yellowlegs and plovers.

Flight is swift, strong, and very erratic; close-knit companies of Leasts, like other small sandpipers, often perform marvelously intricate, turning-and-twisting flights low over water or ground. Alighting, parties keep together or scatter along mud shores in their industrious search for food. On coastal mud flats, individuals probe for small crustaceans and marine worms; in freshwater marshes, they eat primarily insects and their larvae.

The note of the Least Sandpiper, sounded usually when the bird is flushed, is a thin *scree-ee-ee* (very hard *e* sound), followed by several *greet's*. This call is more drawn-out than the comparable vocalization of the Semipalmated Sandpiper. On the breeding grounds, the male utters a series of plaintive trills in minor key during his nuptial flight.



DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts fuscous black, forehead somewhat grayish and slightly mixed with dull black; crown and occiput narrowly streaked with grayish white, pale buff, or tawny, remainder of upper parts edged and tipped with russet, tawny, cinnamon, and white, except rump which has faintly paler tips on feathers, and middle upper tail-coverts which are unmarked, the lateral upper tail-coverts mostly white, somewhat marked with hair brown or fuscous; middle feathers of tail fuscous black, remainder of tail plain drab or light drab; primaries fuscous, shaft of outermost yellowish white, of others, yellowish white on subterminal portions; secondaries hair brown becoming paler on inner webs and almost whitish basally; tertials fuscous black or fuscous, margined with cinnamon, cinnamon russet, and light buff; superciliary stripe dull gray or buffy white mixed with fine streaks and spots of fuscous; loreal stripe fuscous, mixed with buffy white; sides of head and neck pale buff or buffy grayish white, obscurely streaked with fuscous and hair brown; chin white; throat and jugulum grayish white, tinged with buff and with narrow obscure streaks and spots of fuscous and hair brown; remainder of lower parts white; lining of wing white, edges and posterior coverts drab. Bill black but base of mandible dull yellow or dull tawny olive; tongue dull black; iris vandyke brown; legs and feet sulphine yellow, tawny olive, yellowish olive, light olive green, or greenish yellow; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Much lighter and duller than nuptial adults; upper parts warm hair brown, feathers with fuscous black or fuscous centers and slightly paler tips; jugulum less distinctly spotted and streaked. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but some wing-coverts retained from juvenal margined with hazel or light brown. *First winter:* Acquired by partial postjuvinal molt. Like adults in winter, except for tertials, scapulars, and wing-coverts retained from juvenal. Bill black, but base of mandible olive; tongue black; iris prout brown; legs and feet broccoli brown, raw umber, or olive; claws black. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but scapulars and some feathers of back tipped with white, also wing-coverts strongly margined with buff or cinnamon; jugulum usually strongly tinged with cinnamon buff or dull grayish buff and with no streaks or with very indistinct markings. Bill dull black or slate black; iris hazel; legs and feet olive or grayish olive.

MEASUREMENTS: *Adult male:* Wing, 82.0–87.9 (average, 85.6) mm.; tail, 35.1–39.9 (38.6); bill (exposed culmen), 16.0–19.0 (17.3); tarsus, 16.5–19.0 (17.8); middle toe without claw, 15.0–17.0 (16.0). *Adult female:* Wing, 83.1–90.9 (86.6); tail, 34.0–40.9 (37.3); bill, 17.5–20.1 (18.8); tarsus, 16.0–19.0 (18.3); middle toe, 15.5–17.0 (16.3).

TEXAS: *Migration:* Collected north to Clay and Cooke, east to Galveston, south to Cameron, west to Brewster and Hudspeth cos. *Winter:* Taken north to Wise, east to Galveston, south to Cameron, west to Webb and Brewster cos.

[CURLEW SANDPIPER, *Erolia ferruginea* (Pontopidan)]

A small, mainly Old World sandpiper with long (1½ in.) black bill, slightly decurved from base to tip; comparatively long brownish legs; in flight, shows white at base of tail (in Dunlin this area broken by blackish median stripe). *Nuptial:* largely brownish black above; rich russet (darker than spring Dowitcher) on sides of head, neck, breast, and abdomen. *Winter:* resembles the shorter legged, chunkier Dunlin, but is browner above with more clear-cut white stripe over eye; whiter

below with faint grayish streaks confined to sides of breast. Length, 8 in.; wingspan, 15½; weight, 3½ oz.

RANGE: Arctic coast and islands of Siberia. Winters from Africa and s.e. Asia to Australia, Tasmania, and New Zealand. Casual in Alaska and British Columbia, Atlantic seaboard of North America, West Indies, and e. Patagonia.

TEXAS: *Hypothetical:* Three sightings on coast: Galveston Co., Galveston Island (Apr. 13, 1947, G. G. Williams, S. G. Williams, Mr. and Mrs. C. W. Hamilton); Refugio Co., Bayside (Mar. 2, 1958, P. R. Lenna, D. W. Woodard); Aransas Co., near Rockport (Dec. 28, 1970, Nils Ekfelt, C. D. Fisher).]

DUNLIN, *Pelidna alpina* (Linnaeus)

SPECIES ACCOUNT

Erolia alpina of A.O.U. check-list, 1957 (see Appendix A). Also known as Red-backed Sandpiper. A small, plump, short-necked sandpiper with rather long, stout black bill, slightly decurved at tip; in flight, shows narrow white wing-stripe and blackish median rump-stripe. *Nuptial:* largely rusty above; black belly-patch interrupts finely brown-streaked white breast and unmarked white crissum. *Winter:* gray above; white below with gray wash across breast. Length, 8½ in.; wingspan, 15½; weight, 2¼ oz.

RANGE: Circumpolar in Arctic, south locally to British Isles, Baltic region, n. Russia, and c. Canada. Winters chiefly coastally from approximately lat. 60° N. to Mediterranean region, c. India, and U.S. Gulf coast.

TEXAS: (See map.) *Migration:* Mid-Mar. to late May; early Sept. to late Nov. (extremes: mid-Feb., June 30; July 25, late Dec.). Very common to fairly common

along coast; scarce (mainly in fall) to rare through interior eastern three-quarters; casual along New Mexico border. *Winter:* Dec. to Mar. Very common locally to fairly common along coast; uncommon inland in parts of Rio Grande delta; rare to casual locally in interior.

HAUNTS AND HABITS: The Dunlin's migration route is notably short for an arctic-nesting wader—Baja California, Tamaulipas, U.S. Gulf coast, and Florida are the southernmost normal limits for wintering individuals in America. On the breeding grounds, pairs of Dunlins scatter to dry knolls in tundra or coastal marshes to incubate four brown-blotched pale green eggs in a depression lined with grass and leaves. In good numbers, the species spends the cool months on Gulf beaches, bays, and estuaries; transients in interior portions of the state seek rain pools or muddy lakes and ponds. Large flocks of Dunlins feeding or resting on flats often mix with Sanderlings and other shorebirds.

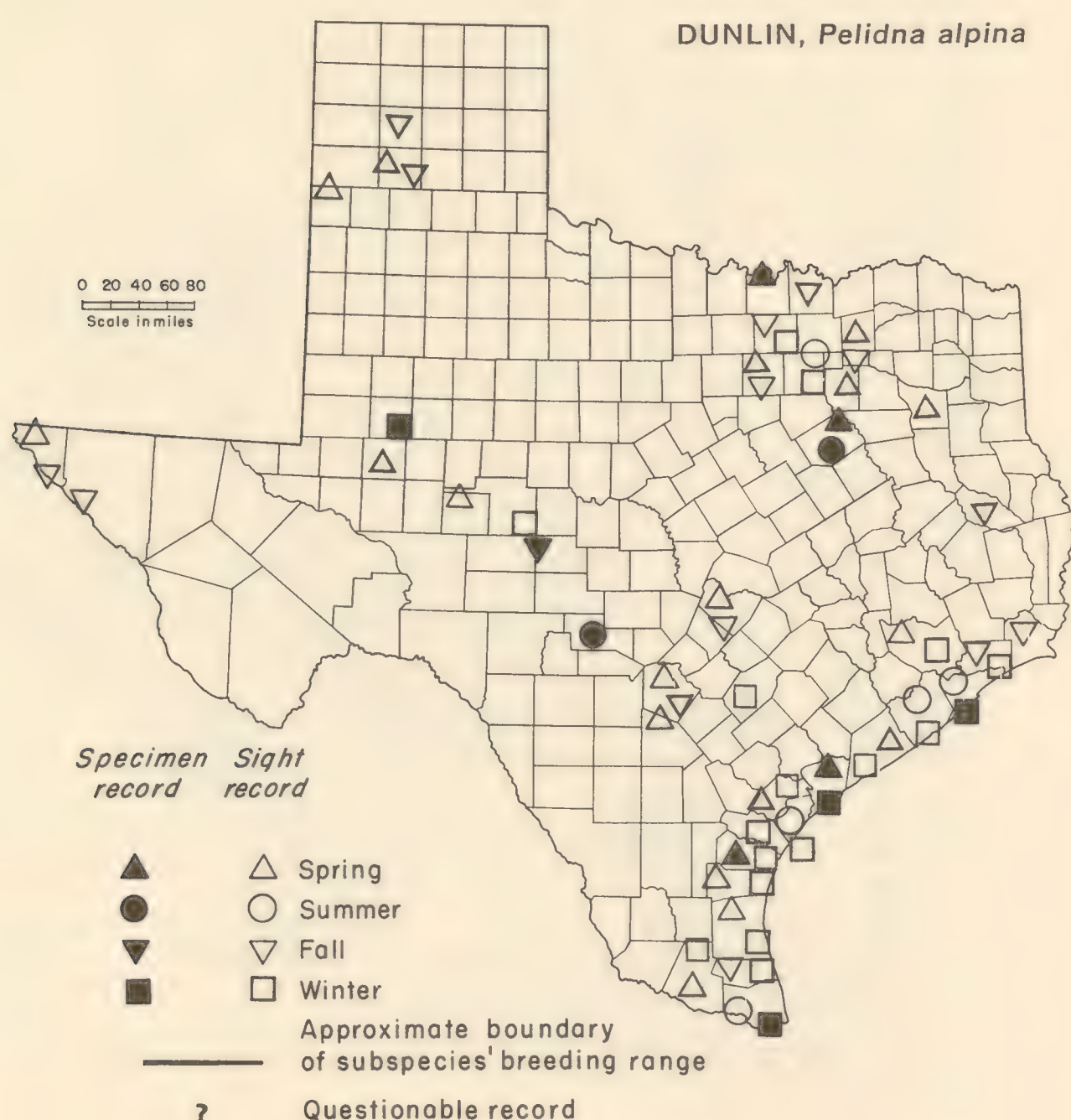
On the wing, the Dunlin is swift. Compact flocks, usually about the feeding areas, fly near the ground or water as they perform intricate evolutions, but when traveling a long distance, groups move high in the sky. Feeding birds probe sand and mud for small mollusks, crustaceans, sand fleas, marine worms, flies, other insects and their larvae. They work on beaches when tide is out, or follow retreating waves to obtain whatever is uncovered. Dunlin feeding behavior varies considerably: At times the birds are energetic and restless, while on other occasions they appear quiet and sluggish.

When flushed, the Dunlin utters an abrupt *chu*; the flight note is a melodic, plaintive *purre*. The bird is otherwise rather silent, especially so in winter.

DETAILED ACCOUNT: ONE SUBSPECIES

RED-BACKED DUNLIN, *Pelidna alpina pacifica* Coues

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Forehead grayish white, minutely flecked with fuscous; remainder of pileum fuscous, streaked and spotted with cinnamon, cinnamon buff, and dull white; hindneck brownish light neutral gray, narrowly and numerous streaked with fuscous; remainder of upper surface fuscous black, this occupying centers of feathers with broad edgings of tawny or orange cinnamon, back and scapulars largely of this color on exposed portions; middle upper tail-coverts fuscous with admixture of tawny; lateral upper tail-coverts mostly white; wing-quills dark hair brown, shafts of primaries mostly white, except at tips, secondaries white basally, and inner feathers nearly all white; wing-coverts hair brown, many with obscure darker shaft markings and paler edgings of brownish white or dull buff; superciliary stripe grayish or buffy white, finely streaked with hair brown; sides of head and neck same, streaks on latter broader and more conspicuous; chin, throat, and jugulum white, latter much streaked with fuscous or hair brown, these streaks finer on throat; breast and upper abdomen dull black, feathers tipped obscurely with grayish white; abdomen and crissum white; lining of wing white, outer under wing-coverts marked with drab. Bill black or dark gray; iris dark brown; legs and feet black or deep grayish olive; eyelids dull gray. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts brownish gray with obscure blackish shaft markings, middle of upper tail-coverts and rump darker (fuscous black), edged with color of back, lateral upper tail-coverts white; wings much as in nup-



tial adults; superciliary stripe more clearly white; lower parts white, tinged with light brownish gray across jugulum and streaked on throat and jugulum with fuscous or hair brown. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but differs in presence of retained buff-tipped wing-coverts. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but upper surface rather paler; wing-coverts and some scapulars and tertials retained from juvenile. Bill black; tongue and inside of mouth slate black; iris vandyke brown; legs, feet, and claws clove brown. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts more strongly tinged with tawny or orange cinnamon and cinnamon; wing-coverts broadly edged with cinnamon buff; rump mostly tawny or russet; breast strongly suffused with buff; posterior lower parts often with large obscure spots of fuscous black.

MEASUREMENTS: *Adult male*: Wing, 108.5–125.5 (average, 115.8) mm.; tail, 41.9–56.9 (52.1); bill (exposed culmen), 31.0–40.9 (35.8); tarsus, 23.1–27.9 (25.1); middle toe without claw, 18.5–22.1 (20.1). *Adult female*: Wing, 114.0–125.0 (117.3); tail, 44.4–55.9 (53.1); bill, 34.0–41.9 (38.4); tarsus, 24.9–26.9 (25.9); middle toe, 19.6–22.1 (20.3).

RANGE: Locally on coasts and lakes from n. Alaska to Baffin Island, south to s.w. Alaska, s. Mackenzie, and n.e. Manitoba. Winters coastally from British Columbia to s. Baja California, and from Massachusetts to Florida and Texas.

TEXAS: *Migration*: Collected north to Cooke, east to Navarro, south to Calhoun and Cameron, west to Schleicher cos. *Winter*: Taken along coast northeast to Galveston, southwest to Cameron cos. One inland specimen: Martin Co., near Stanton (collected from flock of 6, Dec. 23, 1965, David Brown, Jim Henderson, et al.).

DOWITCHER, *Limnodromus griseus* (Gmelin)

SPECIES ACCOUNT

Split into two species—Short-billed Dowitcher, *Limnodromus griseus*, and Long-billed Dowitcher, *L. scolopaceus*—by A.O.U. check-list, 1957 (see Appendix A). A chunky, medium-sized sandpiper with very long, straight black bill; rather short greenish legs. In flight, shows conspicuous white rump-patch which extends in a wedge onto lower back; finely barred tail. *Nuptial*: buff-streaked blackish above; largely cinnamon or rusty below with black spots or short bars on breast, sides, and flanks. *Winter*: dark gray above with white eye-stripe; light gray below. Length, 11 in.; wingspan, 19¼; weight, 3½ oz.

RANGE: Locally from n.e. Siberia, n. Alaska, s. Mackenzie, and n. Quebec, south to s. Alaska, c. Alberta, and n. Ontario. Winters from c. California, Gulf coast, and South Carolina to Peru, Argentina, and Brazil; also West Indies.

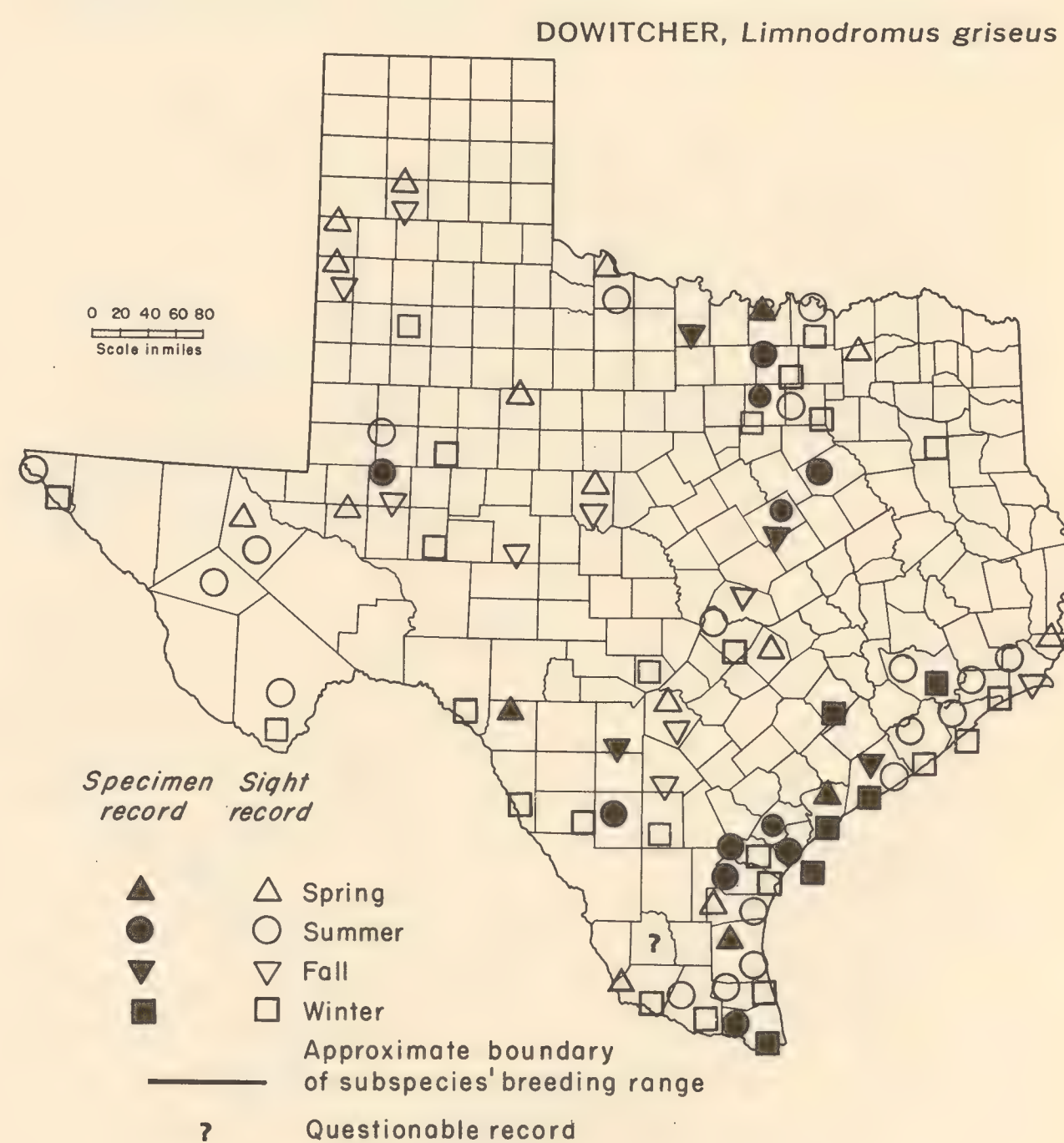
TEXAS: (See map.) *Migration*: Early Mar. to late May; mid-July to mid-Nov. (extremes: Feb. 12, June 19; July 4, Dec. 2). Very common to fairly common along coast; common to uncommon through most of interior, but rare in Big Bend region. *Winter*: Early Nov. to early Mar. Very common to fairly common along coast; fairly common to uncommon inland in Rio Grande delta; scarce to rare through most of interior.

HAUNTS AND HABITS: The long-billed (even short-

billed birds have very long beaks), chunky-bodied Dowitcher might be defined as a snipelike wader which stays out in the open instead of hiding in grass or sedge. It is most frequently seen on broad flats of bays or bordering reedy marshes. Wintering birds on the Gulf coast feed along shores of lagunas, salt marshes, and estuaries (rarely on beaches at surf's edge); in the interior, migrating groups congregate on mud banks of rain puddles, lakes, and ponds. In Texas, the Long-billed race, *L. g. scolopaceus*, is the most common of the three subspecies, both in migration and winter. On the arctic and subarctic breeding grounds, the Dowitcher hollows a depression, which it lines with grass and moss, on wet tundra or tundralike muskeg in spruce and tamarack forests.

Dowitcher flight is strong and swift with relatively rapid wing-beats; it is often long sustained and high in the air when birds are scouting for feeding places. These birds usually fly and feed in compact flocks of their own kind, although such companies often affiliate with groups of other shorebirds. On flats and in shallow water, it moves methodically as it probes with its long straight beak in mud and sand for marine worms, crustaceans, and mollusks; various aquatic insects are taken in freshwater situations. The bill action of the Dowitcher, an important diagnostic point, involves quick perpendicular thrusts which resemble the up-and-down stitching of a sewing machine needle.

Vocalizations of the two short-billed races (Eastern and Alberta) are distinct from the Long-billed (western) race. Former birds utter rapid metallic *tu-tu-tu*'s; individuals of the latter race sound single (sometimes trebled), thin, higher pitched *keek*'s.



DETAILED ACCOUNT: THREE SUBSPECIES

EASTERN DOWITCHER, *Limnodromus griseus griseus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts generally dull black or fuscous black; forehead dull white, pileum and hindneck with edgings of light pinkish cinnamon or vinaceous buff, back and scapulars largely black with imperfect bars or spots of pale buff, dull white, and cinnamon; rump white; upper tail-coverts white, numerous bars with chaetura black; tail hair brown or drab, numerous but irregularly barred with white, middle tail feathers darker and sometimes tinged with buff; primaries fuscous, shaft of outermost feathers yellowish white, innermost primaries, with secondaries, hair brown, secondaries broadly tipped with white and somewhat mottled with dull white on inner webs; tertials dull black with bars of cinnamon or dull white; wing-coverts hair brown or rufescent hair brown, narrowly and inconspicuously margined with paler brown; superciliary stripe buffy white, somewhat finely mixed with fuscous; loreal stripe fuscous; remainder of sides of head and of neck dull buffy white, much streaked with fuscous; extreme point of chin buffy white; throat and breast dull light pinkish cinnamon; abdomen like breast but often a little mixed with white; jugulum and sides of breast thickly marked with roundish spots of fuscous or fuscous black; sides and flanks barred with same; lower tail-coverts less conspicuously barred with fuscous black and tinged with cinnamon; lining of wing white, barred and spotted with hair brown. Bill dark olive but somewhat lighter at base, with trace of orange on base of mandible; tongue dark olive; inside of mouth olive; iris reddish hazel or vandyke brown; feet light yellowish olive, olive buff, or greenish black; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts light brownish gray with obscure shaft markings of darker gray, hindneck palest; rump and upper tail-coverts white, barred or spotted with fuscous black; sides of neck like hindneck; lower parts white, throat and jugulum light drab, spotted and barred with light hair brown, and sides and flanks barred and spotted with same; lower tail-coverts barred and spotted with hair brown and fuscous black. Bill, legs, and feet as in nuptial. *First nuptial:* Acquired usually by partial prenuptial molt. Similar to nuptial adults, but differs in presence of many feathers from first winter, particularly in scapulars, wing-coverts, tail, and in mostly or entirely white abdomen. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but differs in retention of juvenile scapulars, tertials, and upper wing-coverts. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but back, scapulars, and tertials much more extensively ochraceous, feathers of back, scapulars, and tertials very broadly margined with light clay color or cinnamon; lower parts mostly buffy white; throat, jugulum, and sides strongly suffused with light cinnamon buff and obscurely marked with hair brown. Bill olive or isabella color, but dull black at tip, and tawny olive at base; iris drab; legs and feet tawny olive or yellowish olive; claws black.

MEASUREMENTS: *Adult male:* Wing, 133.1–147.1 (average, 142.0) mm.; tail, 53.1–55.9 (54.8); bill (exposed culmen), 52.1–56.9 (54.6); tarsus, 29.9–35.1 (32.5); middle toe without claw, 22.1–27.7 (25.1). *Adult female:* Wing, 134.1–149.1 (142.2); tail, 52.1–59.4 (56.1); bill, 51.6–63.5 (57.9); tarsus, 31.0–39.1 (34.0); middle toe, 23.1–26.9 (25.1).

RANGE: Breeding range not entirely known, but probably n. Ontario and n. Quebec. Winters chiefly in Bahamas and Lesser Antilles and on coast of Brazil; a few coastally from Gulf states to South Carolina.

TEXAS: *Migration:* Collected along coast northeast to Matagorda, southwest to Cameron cos. Uncommon.

ALBERTA DOWITCHER, *Limnodromus griseus hendersoni* Rowan

DESCRIPTION: *Adults, nuptial plumage:* Similar to *L. g. scolopaceus* (see below), but wing longer; bill shorter, lower parts lighter, jugulum much less spotted or barred. *Adults in winter, and juvenal:* Similar to *L. g. griseus* but larger, particularly bill and wing; lower parts darker, more uniform cinnamon, and throat and jugulum less spotted.

MEASUREMENTS: *Adult male:* Wing, 140.0–150.1 (average, 145.0) mm.; tail, 51.1–58.9 (55.6); bill (exposed culmen), 53.1–61.0 (56.9); tarsus, 33.0–37.6 (35.1); middle toe without claw, 24.9–27.4 (26.2). *Adult female:* Wing, 143.0–151.9 (147.1); tail, 53.6–58.4 (55.6); bill, 56.9–66.0 (61.5); tarsus, 34.0–39.9 (36.6); middle toe, 24.9–28.4 (27.2).

RANGE: S. Mackenzie, south to c. Alberta and n.e. Manitoba. Winters coastally from Costa Rica to Ecuador and Peru; also Bahamas.

TEXAS: *Migration:* Collected in McLennan (July 26), Refugio (July 15), San Patricio, Nueces, and Cameron cos. Uncommon.

LONG-BILLED DOWITCHER, *Limnodromus griseus scolopaceus* (Say)

Limnodromus scolopaceus of A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Similar to *L. g. griseus* but much larger, particularly bill; under parts, particularly abdomen, more uniform and darker cinnamon; breast mostly barred instead of spotted, and flanks more heavily barred. Bill black, but becoming olive at base; iris vandyke brown; legs and feet yellowish olive; claws black. *Adults in winter, and juvenal:* Similar to *L. g. griseus* but darker.

MEASUREMENTS: *Adult male:* Wing, 135.1–146.0 (average, 141.0) mm.; tail, 52.1–55.9 (54.6); bill (exposed culmen), 57.9–66.0 (62.2); tarsus, 32.5–39.9 (37.6); middle toe without claw, 24.9–27.7 (26.2). *Adult female:* Wing, 140.0–152.9 (146.3); tail, 54.6–60.2 (56.9); bill, 68.1–78.0 (72.4); tarsus, 38.1–46.5 (40.9); middle toe, 24.9–29.4 (27.2).

RANGE: On coasts and rivers from n.e. Siberia to n. Alaska and n.w. Mackenzie. Winters from c. California to Florida through Mexico (chiefly western) to Ecuador and Argentina.

TEXAS: *Migration:* Collected north to Clay and Cooke, east to Harris, south to Cameron, west to Kinney cos. Common. *Winter:* Taken mainly along coast northeast to Colorado and Harris, southwest to Cameron cos. Common.

STILT SANDPIPER, *Micropalama himantopus* (Bonaparte)

SPECIES ACCOUNT

A slender, medium-sized sandpiper with long black bill, slightly decurved at tip; very long greenish legs. *Nuptial:* buffy-scaled blackish above with rusty ear-patch; conspicuously brown-barred below. *Winter:* grayish above with white eye-stripe; unbarred white below; suggests Dowitcher, but white at base of tail restricted (does not extend onto lower back); under parts whiter; bill shorter; legs longer. Length, 9 in.; wingspan, 16¾; weight, 2¼ oz.

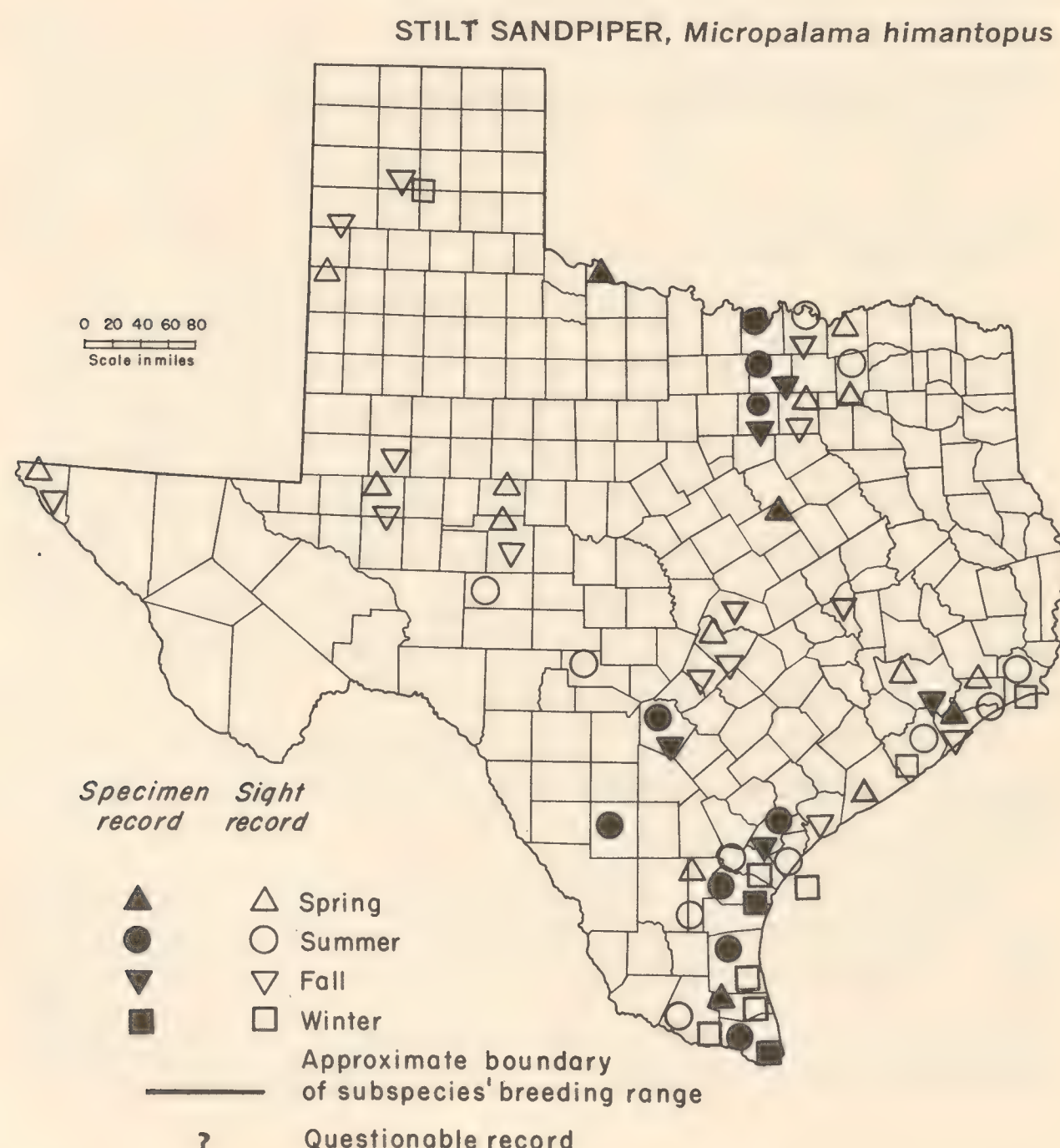
RANGE: N.e. Alaska to w. shores of Hudson Bay. Winters chiefly from Bolivia and Mato Grosso of Brazil to c. eastern Argentina.

TEXAS: (See map.) *Migration:* Late Mar.—often mid-Apr.—to late May; mid-July to late Oct. (extremes: Mar. 15, June 12; July 1, Nov. 27). Common to fairly common along coast; fairly common to uncommon through most of interior eastern three-quarters; scarce

to rare along New Mexico border. Dec. record from northern Panhandle probably represents extremely late fall straggler: Palo Duro Canyon (1 on Amarillo Audubon Christmas Bird Count, Dec. 23, 1969, Carroll Littlefield, Kenneth Seyffert). *Winter*: Dec. 15 to Mar. 5. Irregularly uncommon to rare along central and lower coasts and in Rio Grande delta; casual on upper coast.

HAUNTS AND HABITS: Superficially, the Stilt Sandpiper recalls a Lesser Yellowlegs, and when feeding, its actions are often very Dowitcher-like. Its tundra nest, a sparsely lined depression on the ground near water, holds usually four brown-blotched eggs. Leaving the breeding grounds in early summer, adults—followed in a month or so by young—migrate chiefly across the short grass of the western Great Plains. In fall and spring in Texas, transient Stilts appear on sandy Gulf beaches and mud flats and similar shorelines of lakes, pools, rivers, and streams in the interior; a very few winter coastally. Companies of this sandpiper, as a rule, are small and compact; frequently Stilts associate with Greater and Lesser yellowlegs, Dowitchers, and other sandpipers.

Flight is direct and rapid. On the ground the Stilt walks more deliberately than most other medium-sized sandpipers. Individuals, scattered or in close-knit groups, quietly and systematically work a small section of beach, rather than range over a large area as do yellowlegs. Standard Stilt feeding places are shallow pools—one to three inches deep—left in marshes and on mud flats at ebb tide. Here the bird probes for small mollusks and crustaceans, often breast-high in the water and with bill and head (generally up to the eyes) submerged for several seconds at a time. Additional food includes fly larvae, other insects, and a few seeds.



The Stilt plunges its bill in a Dowitcher-like manner with vertical thrusts, or sweeps it along the bottom with sidewise strokes.

The Stilt Sandpiper's flight note is a hoarse single *whu*, similar to that of the Lesser Yellowlegs but lower pitched; this sometimes extends to *whr-r-u*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts dull black or fuscous black, pileum streaked with white and dull pale buff, remainder of upper surface with edgings and tips of same; streak on side of occiput, meeting across nape, light cinnamon rufous; rump hair brown, feathers edged with whitish or pale gray; upper tail-coverts white barred with hair brown; tail light hair brown or drab, base white, this extending along shaft and mottling outer feathers; primaries fuscous black, paler on inner webs and very slightly tipped with brownish white; secondaries hair brown; wing-coverts hair brown, anterior lesser wing-coverts darker, remainder with obscure edgings of pale brownish gray; loreal streak fuscous or buffy brown; superciliary stripe buffy white; postocular stripe light cinnamon rufous; remainder of sides of head dull buffy white, finely streaked with fuscous; sides of neck dull grayish white, washed with buff and heavily streaked with fuscous; lower parts buffy white or light pinkish buff, barred with fuscous or hair brown, except for sparse streaking and spotting on throat and more numerous streaks on lower throat; lining of wing white, mottled with hair brown or drab on outermost and hindmost feathers. Bill black or clove brown, but base olive; tongue and inside of mouth slate color; iris vandyke brown; legs and feet raw umber, dull yellowish green, greenish yellow, olive yellow, or yellowish olive; claws black or seal brown. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts brownish gray, almost uniform, feathers with narrow grayish white edges, and wing-coverts tipped with dull white; superciliary stripe white; sides of head white or pale grayish and brownish gray; loreal streak and sides of neck dull grayish white, broadly or obscurely spotted with hair brown or light drab; remainder of lower surface white, lower tail-coverts with a few spots or light markings of light hair brown. Legs and feet dull dark green. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by apparently partial prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but differs in presence of retained juvenal scapulars, tertials, and wing-coverts. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts much more strongly tinged with russet, cinnamon, and buff, this mostly in form of edgings and tips of feathers; many of upper lesser wing-coverts broadly edged with pale buff or with pale dull white; cinnamon of sides of head almost absent; lower throat, jugulum, and sides dull light cinnamon buff, with obscure streaks or spots of hair brown and fuscous; breast and abdomen very pale buff or buffy white; lower tail-coverts pure white slightly streaked or spotted with drab. Bill black or clove brown; tongue olivaceous black; iris vandyke brown; legs and feet yellowish olive buff or greenish tawny olive, but webs between toes tawny olive; claws black.

MEASUREMENTS: *Adult male:* Wing, 116.6–130.0 (average, 124.2) mm.; tail, 45.5–54.6 (51.1); bill (exposed culmen), 35.1–42.4 (38.6); tarsus, 37.6–43.4 (40.9); middle toe without claw, 20.1–22.9 (21.6). *Adult female:* Wing, 124.5–136.9 (130.5); tail, 48.5–57.9 (53.3); bill, 37.6–43.9 (41.7); tarsus, 39.1–46.0 (42.2); middle toe, 21.1–22.6 (22.1).

TEXAS: *Migration:* Collected north to Wilbarger, east to Cooke (Aug. 19) and Galveston, south to Cameron, west to La Salle (Aug. 28) cos. *Winter:* Two specimens: Nueces Co., Corpus Christi (Jan. 19, 1890, J. M. Priour); Cameron Co., Padre Island (Feb. 26, 1894, E. C. Greenwood; Chicago Natural History Museum collection).

SEMIPALMATED SANDPIPER, *Ereunetes pusillus* (Linnaeus)

SPECIES ACCOUNT

A medium-sized peep with short ($\frac{3}{4}$ in.) rather stout bill; blackish legs. *Nuptial*: blackish buff above; generally has fewer markings on breast than any other peep. *Winter*: grayish above; largely white below. Length, $6\frac{1}{4}$ in.; wingspan, $12\frac{1}{4}$; weight, $\frac{3}{4}$ oz.

RANGE: N. Alaska, Boothia Peninsula, and c. Baffin Island, south to e. Mackenzie and n. Labrador. Winters chiefly from U.S. Gulf coast and South Carolina through e. Mexico to n. Chile, Paraguay, and s. Brazil; also West Indies.

TEXAS: (See map.) *Migration*: Late Mar. to late May; mid-July to late Oct. (extremes: Feb. 16, June 25; June 27, early Nov.). Very common to fairly common along coast; common to uncommon through interior west to Pecos River Valley; rare at El Paso. *Winter*: Nov. to late Mar. Very common locally to fairly common along coast; locally fairly common to uncommon inland in south Texas north to San Antonio; scarce in west Texas east of Pecos River; scarce to rare in north central Texas, south to Austin and Huntsville; over-winter records lacking from most of wooded eastern quarter.

HAUNTS AND HABITS: In Texas, the Semipalmated Sandpiper—so named for its partially webbed feet—joins other wintering peeps on beaches and exposed mud flats of the Gulf coast; migrants appear in most parts of the state along open shores of rivers, streams, lakes, and ponds. The bird is an arctic breeder which nests on a ridge or knoll in wet tundra usually near a

small lake or in grassy dunes along the coast; its scrape is a hollow lined with willow leaves, moss, and grass. Adults typically leave the Arctic for wintering grounds in mid-summer; the young, about two weeks old and just learning to fly when the adults depart, follow a month or so later.

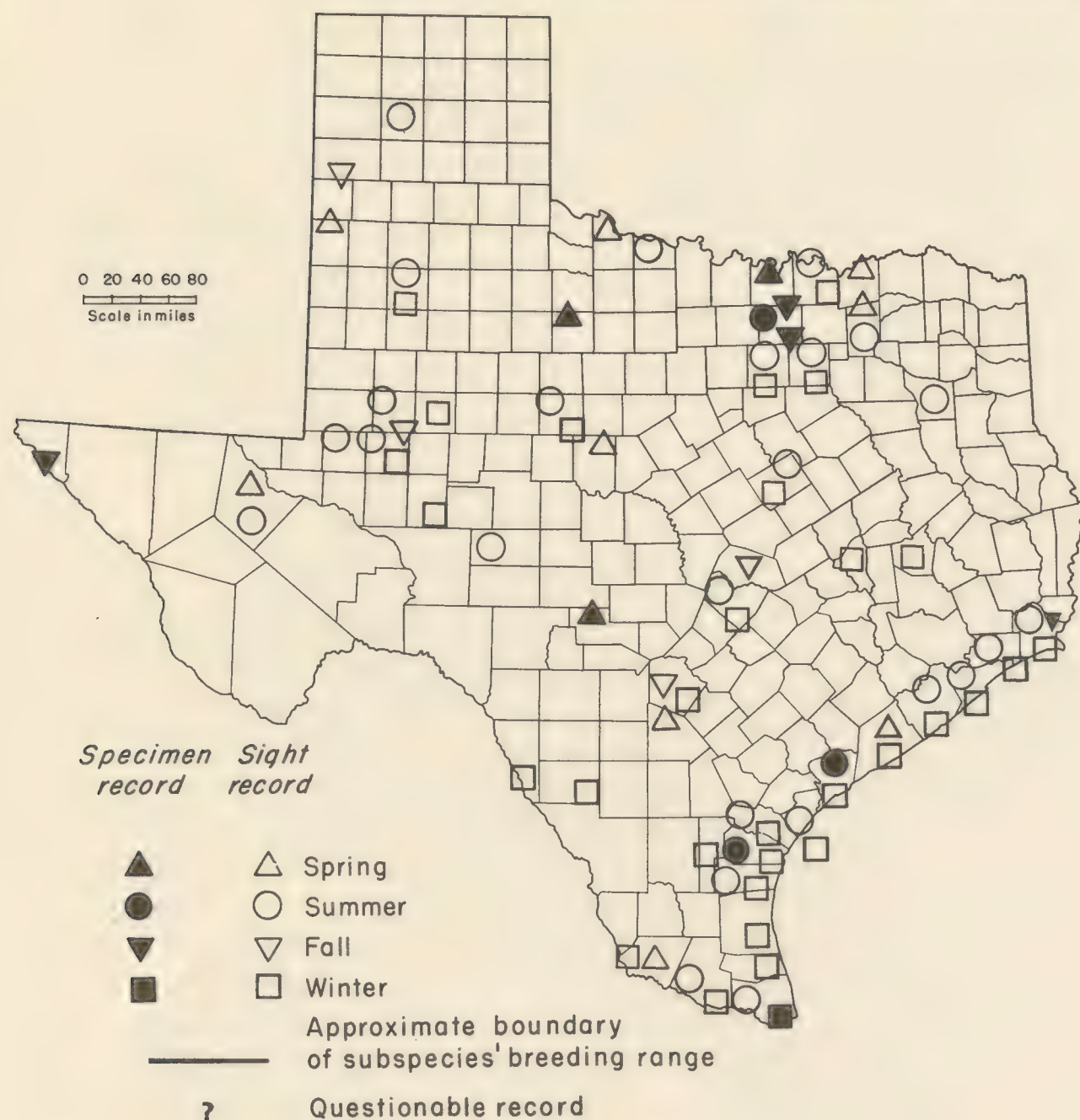
Flight of this bird is swift, buoyant, and performed with rapid wing-beats. Usually near the ground or water's surface, close formations of these peeps, like other small sandpipers, perform remarkable evolutions—twisting, turning, rising, diving, spreading out lengthwise or sidewise, separating into two or three groups and again uniting. At a distance, such a company resembles a long piece of cloth rippling in the wind. A flock may alight suddenly, and the birds either stand quietly or scatter to feed. On flats a foraging Semipalmated Sandpiper runs rapidly in the wake of retreating waves, dashes back ahead of incoming ones, or flies up if overtaken by the surf. Individuals also wade into very shallow water to feed. As it searches for small mollusks, crustaceans, and marine worms, this bird probes sand with its short bill in a manner which is very random and un-Sanderling-like, but nonetheless rapid (as many as 40 thrusts per minute). Birds at rest, usually on dry sand of upper beaches, stand quietly, often tightly huddled.

Flight note of the Semipalmated Sandpiper is a simple *cherk* or *cher*; a *crip* is also sounded. These all lack the sharpness of the other peeps' vocalizations. Feeding parties converse with twitters, chippings, and rolling notes. In the Arctic, this sandpiper accompanies its nuptial flight with cicadalike buzzing that terminates with melodic goldfinchlike notes.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum fuscous or fuscous black, paler on forehead, feathers of pileum narrowly edged with buffy white or pale buff; hindneck similar but more mixed with white or dull pale buff; back and scapulars black or fuscous black, with edgings of grayish white, pale buff, and cinnamon buff; rump fuscous, feathers with paler edgings; middle upper tail-coverts the same; lateral upper tail-coverts white; middle tail feathers fuscous black; remainder of tail light drab, inner edges of outer webs becoming white basally; wing-quills fuscous, shaft of outermost primary yellowish white, and of others yellowish white subterminally; secondaries becoming whitish on inner webs at base, all with whitish shafts; tertials fuscous with slightly paler margins; superciliary stripe white, slightly mixed with fine streaks and spots of fuscous, particularly behind eye; loreal stripe of dull hair brown or light fuscous; sides of head and of neck brownish or buffy white, auriculars washed with dull buff, and all obscurely streaked with fuscous or hair brown; lower surface white, throat and jugulum washed with pale brownish gray, finely streaked or spotted with fuscous or hair brown; lining of wing white, outer edge mottled with hair brown, posterior coverts light drab. Bill black, mandible and base of maxilla greenish olive; tongue olive gray, clove brown, or slate color; inside of mouth olive gray or black; iris vandyke brown; legs black, olivaceous black, olive brown, or clove brown; feet olive, mouse gray, or clove brown; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Upper parts light brownish gray, centers of feathers fuscous or blackish, colors darker posteriorly; lower parts white, jugulum and sides of breast slightly washed with gray and with a few narrow streaks of

SEMIPALMATED SANDPIPER, *Ereunetes pusillus*



hair brown or drab. *First nuptial*: Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Closely resembles adults in winter, but differs in presence of retained juvenal feathers on scapulars, wing-coverts, and a few on body. Legs and feet clove brown or olivaceous hair brown. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts strongly suffused with buff or cinnamon, scapulars with dull white or buffy tips; jugulum washed with dull light buff and practically without streaks or spots. Bill black; iris black; legs and feet olivaceous black.

MEASUREMENTS: *Adult male*: Wing, 87.9–98.6 (average, 93.7) mm.; tail, 38.1–44.4 (41.1); bill (exposed culmen), 17.0–20.1 (18.8); tarsus, 19.0–21.1 (20.6); middle toe without claw, 15.0–17.5 (16.3). *Adult female*: Wing, 91.9–101.6 (96.5); tail, 39.9–43.9 (41.4); bill, 18.0–22.1 (20.3); tarsus, 20.1–22.1 (20.9); middle toe, 15.0–17.5 (16.5).

TEXAS: *Migration*: Collected north to Haskell and Cooke, east to Jefferson, south to Cameron, west to El Paso cos. *Winter*: One specimen: Cameron Co. (Jan. 5, 1927, G. S. Wing).

WESTERN SANDPIPER, *Ereunetes mauri* Cabanis

SPECIES ACCOUNT

Closely resembles slightly smaller Semipalmated Sandpiper, but with long (1 in.) tapering bill, slightly decurved at tip; blackish legs. *Nuptial*: rusty (not blackish buff) above; brownish streaks more numerous on breast. *Winter*: closely resembles Semipalmated, but with trace of rusty on shoulder (fallible). Length, 6½ in.; wingspan, 12¼; weight, ca. 1 oz.

RANGE: Coasts of w. and n. Alaska. Winters in s. United States, and coastally from Washington to Peru and from North Carolina to Venezuela; also West Indies.

TEXAS: (See map.) *Migration*: Late Mar. to mid-May; mid-July to early Nov. (extremes: Mar. 3, May

31; July 2, Nov. 21). Very common (usually in fall) to common along coast; common to fairly common through interior western two-thirds, but scarce in Big Bend region; scarce inland through much of eastern third. *Winter*: Late Nov. to late Mar. Very common locally to fairly common along coast and in Rio Grande delta; uncommon to scarce in much of west Texas; scarce to rare in north central and central portions, where recorded at Denton, Fort Worth, Dallas, Austin, and San Antonio; virtually absent from wooded eastern quarter.

HAUNTS AND HABITS: In 1864 the Western Sandpiper was finally recognized as a species apart from the Semipalmated Sandpiper. Even with today's clear binoculars and telescopes, bird watchers have to look closely to note that the Western is a bit larger of body and has a slightly longer bill which is somewhat decurved. In coastal regions of northwestern Alaska, the Western breeds in scattered colonies; the nest—a shallow depression lined with grass and tiny leaves and found in variable states of concealment—is hollowed on low damp ground, moss-covered mountain slope, or dry upland tundra. The bird migrates throughout Texas, visiting rivers, creeks, lakes, ponds, and rain pools, but winters mainly on the Gulf coast (a few locally in western portions), where it congregates usually with other peeps on beaches and broad mud flats.

This bird flies swiftly on rapid wing-beats, often with many gyrations, as it moves low over the water; flight from feeding grounds to nighttime resting place is more direct. In migration, it takes to higher altitudes. Sometimes, dense flocks of Westerns perform evolutions like those of the Semipalmated and Least sandpipers. Usually following very closely the ebb and flow of the surf, this bird searches sand for small crustaceans and mollusks; when feeding in shallows, it tends to wade in slightly deeper water than other peeps. In grassy situations, where it appears to have little difficulty threading its way, even on the run, the Western takes beetles, bugs, flies, mosquitoes, and other insects and their larvae.

The common note of the Western Sandpiper, usually uttered in flight, is a rather plaintive *kreep* (also rendered *jeet* or *jee-rp*) which is thinner than that of the Semipalmated. Individuals converse incessantly with soft rolling whistle-like sounds when feeding.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Above black or fuscous black, forehead whitish, pileum mostly streaked and spotted with dull cinnamon, cinnamon buffy, tawny, and dull white, leaving only center of crown mostly dull black; hindneck so broadly streaked with same colors as to appear lighter, back and scapulars edged and tipped still more conspicuously with same; rump fuscous, feathers with slightly paler edges; middle upper tail-coverts black or fuscous black; middle tail feathers same; remainder of tail plain light drab, becoming paler on inner webs of feathers; lateral upper tail-coverts white, obscurely streaked with hair brown or fuscous; primaries fuscous, paler on inner webs, shafts mostly white; secondaries hair brown, white on basal portion of inner webs, tertials fuscous edged with brownish white, cinna-

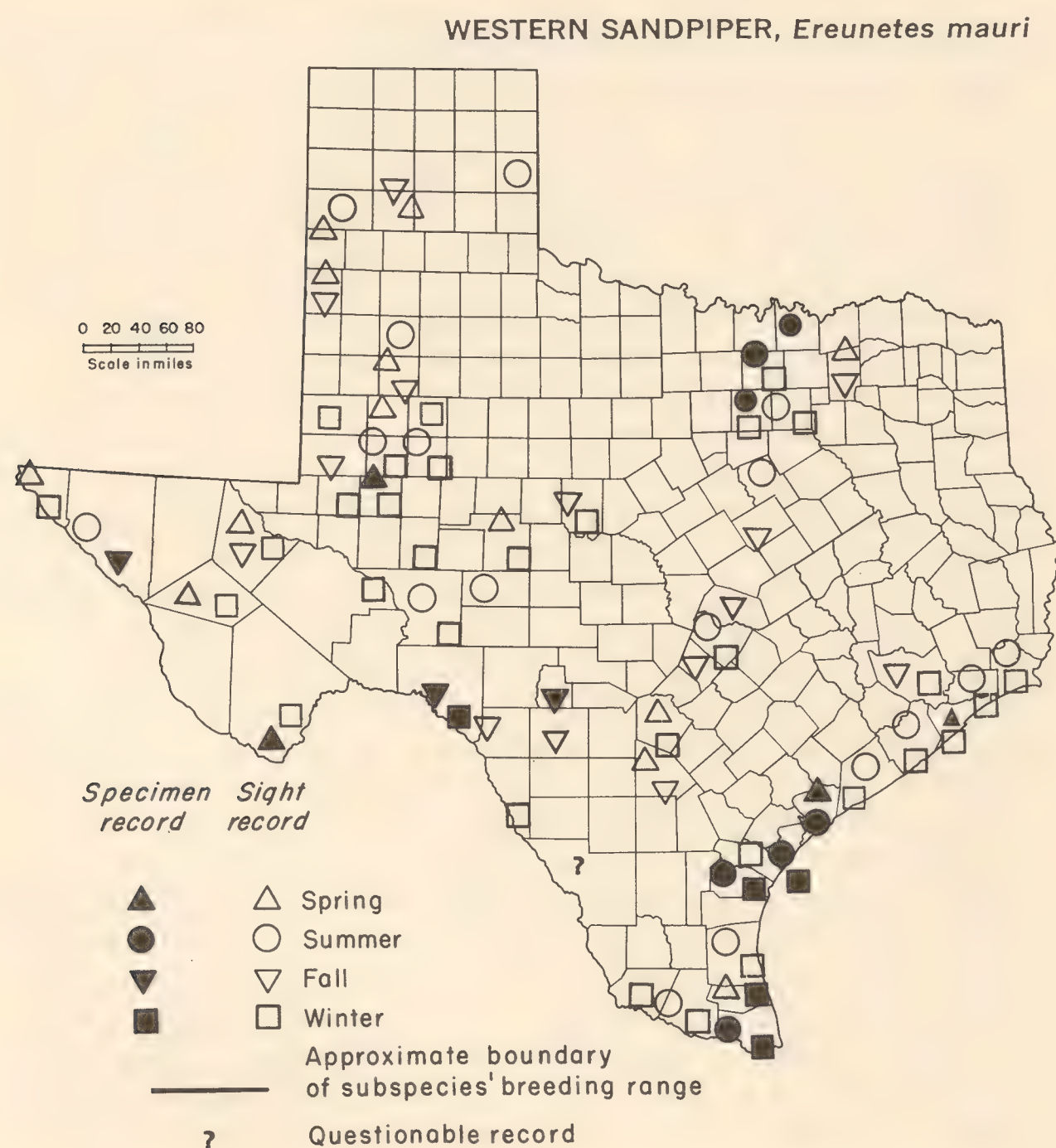




PLATE 12: Short-eared Owl, *Asio flammeus*

mon, or tawny; wing-coverts hair brown edged with paler; supraloral stripe white; loral stripe fuscous, mixed with whitish; sides of head dull buff or grayish white, very finely and numerous streaked with fuscous and hair brown, ear-coverts partly ochraceous; lower parts white, jugulum slightly tinged with very pale gray, spotted and narrowly streaked with chaetura black or hair brown, a few spots of this kind also on breast and sides; lining of wing white, outer edge mottled with hair brown. Bill black or brownish black; tongue black; iris vandyke brown; legs and feet olivaceous black. *Adults, winter*: Acquired by complete postnuptial molt. Upper parts light brownish gray, darker posteriorly and with shaft streaks of fuscous or hair brown; lower parts white, with a few fine hair brown streaks or spots on jugulum, and sometimes on sides of body. *First nuptial*: Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter*: Acquired by partial postjuvinal molt. Similar to adults in winter, but differs in presence of juvenal wing-coverts and a few scapulars and tertials. Bill and inside of mouth black; tongue slate color; iris raw umber; legs and feet clove brown. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults but darker and duller, with less tawny or ochraceous on upper parts, scapulars with white edgings, wing-coverts more suffused with buff; lower parts pure white without markings, except slight wash of buff across jugulum. Bill dull black; tongue black; iris vandyke brown; legs and feet grayish black or clove brown; claws black.

MEASUREMENTS: *Adult male*: Wing, 90.9–99.1 (average, 94.7) mm.; tail, 37.6–41.9 (40.1); bill (exposed culmen), 20.6–23.6 (22.6); tarsus, 20.6–22.1 (21.4); middle toe without claw, 15.0–16.5 (15.7). *Adult female*: Wing, 89.9–99.6 (96.3); tail, 38.1–47.0 (41.7); bill, 23.1–27.9 (25.7); tarsus, 21.1–23.9 (22.4); middle toe, 16.0–17.0 (16.8).

TEXAS: *Migration*: Collected north to Grayson (Aug. 13), east to Galveston, south to Cameron, west to Brewster and Hudspeth cos. *Winter*: Taken along coast northeast to Galveston (Mar. 24), southwest to Cameron cos.; also inland in Val Verde Co.

BUFF-BREASTED SANDPIPER, *Tryngites subruficollis* (Vieillot)

SPECIES ACCOUNT

A round-headed, slender-necked sandpiper suggesting a tiny Upland Plover. Brownish buff above; uniformly buffy below (except for a few dark brown spots on sides of neck and breast) contrasting with white wing-lining; small blackish bill; whitish eye-ring; yellowish legs. Length, 8¼ in.; wingspan, 16½; weight, 2½ oz.

RANGE: Locally from n. Alaska and n.w. Mackenzie to Melville, Bathurst, and King William islands. Winters in c. Argentina.

TEXAS: (See map.) *Migration*: Early Apr. to mid-May; early Aug. to early Oct. (extremes: Mar. 7, May 30; July 7, Oct. 24). Locally common to fairly common in spring near coast; uncommon to scarce through interior eastern half; rare west to Midland. Fairly common in fall near coast; fairly common to uncommon through interior eastern two-thirds; rare through western third east of Pecos River; casual at El Paso.

HAUNTS AND HABITS: The Buff-breasted Sandpiper is remarkably like a miniature Upland Plover in shape and in the type of habitat it frequents. Its general (but by no means exclusive) migration route—off-shore from eastern Canada to South America in fall,

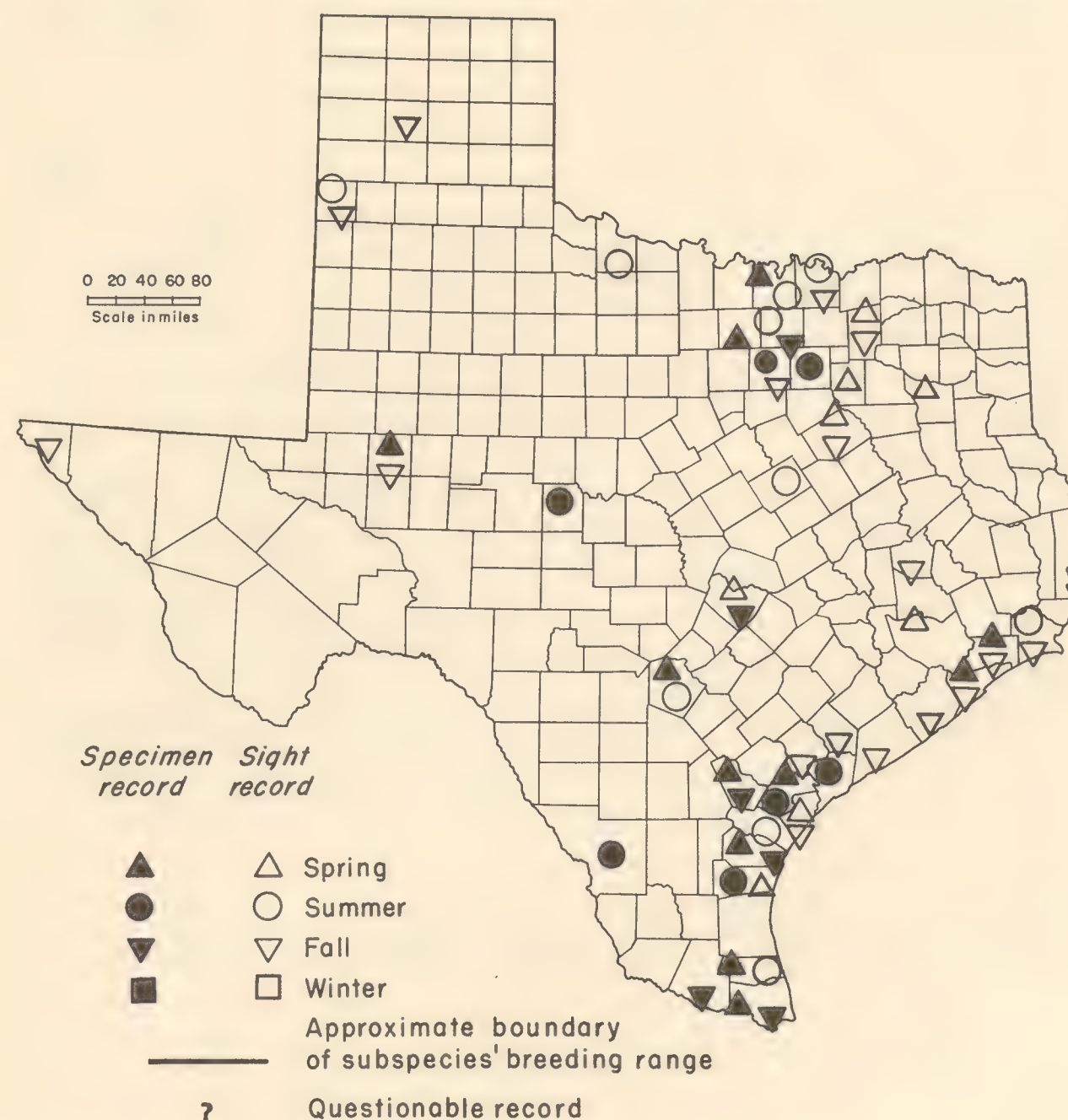
and north from Argentina through U.S. Great Plains to northwestern American Arctic in spring—is similar to that of three other prairie shorebirds: American Golden Plover, Eskimo Curlew, and Hudsonian Godwit. On the breeding grounds, the Buffbreast builds its nest on high and dry barren earth; it is a hollow lined with a few withered leaves or bits of moss.

It is in spring that the Buffbreast flashes his great mark of distinction—the spectacular wing-linings. Even on a mere migration stopover, as near Rockport, Texas, strolling individuals within a flock pause frequently to lift high one or both wings, revealing the snowy underwing with its delicate dusky flecks and vermiculations. This display probably impresses other Buffbreasts. It has certainly impressed bird artists, especially those in Japan where the present sandpiper is only an accidental!

In Texas, springtime transients linger in dry, short grass and almost bare fields on coastal prairies, usually well out of sight and sound of salt water. In fall, those that pass through the state are most likely to be seen on grassy or muddy edges of ponds. Very gregarious, the Buffbreast gathers in parties with its fellows or joins other grassland shorebirds, chiefly Golden and Upland plovers.

Near the ground this sandpiper's flight is twisting and erratic—often whole flocks perform gyrations; at a high altitude it is more direct. Ploverlike, it runs about rapidly in search of beetles, flies, locusts, grasshoppers, crickets, and ants, also a few small mollusks and seeds of various freshwater plants. Buffbreasts rely much on their protective coloration. When alarmed, birds typically do not take to the air, even when companion sandpipers and plovers fly off. They either freeze in very erect posture or, in the manner of some partridges,

BUFF-BREASTED SANDPIPER, *Tryngites subruficollis*



scurry on foot to seek cover. If a bird flies at all, it usually only goes a few feet before landing again.

Buff-breasted Sandpipers sound thin *tik tik tik's* (much like the sound of two small stones being struck together) in spring. They also trill a low *pr-r-r-reet*. These sounds are associated with the wing-flash display performed at resting points along the migration route as well as on the breeding ground.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (light phase):* Acquired by partial prenuptial molt from winter plumage. Upper parts dull black, all feathers broadly edged and tipped with light grayish buff or light drab buff, these markings broadest on anterior and lateral portions of pileum and on hindneck, narrowest on back and rump; middle tail feathers fuscous with slight metallic olive green sheen; rest of tail hair brown, somewhat mottled with fuscous black, also having broad subterminal area of fuscous black and tip of buffy white; primaries fuscous, tips fuscous black, inner webs becoming white basally, and most of remaining portion finely mottled with white, shafts of feathers paler; tertials fuscous with paler margins like feathers of back; secondaries hair brown, white basally, and on inner webs terminally mottled with dull black; sides of head and of neck dull light pinkish cinnamon or deep pinkish buff, the latter broadly streaked with fuscous black; lower parts same with a few roundish spots of fuscous black on sides of breast and jugulum; middle of abdomen and lower tail-coverts paler than breast; lining of wing white, inner webs of outer feathers with flecks of dark brown, posterior coverts with subterminal spots of glossy black, and some vermiculations of this color. Bill grayish black, but base deep olive gray or clove brown; iris prout brown, cameo brown, or tawny olive; legs and feet deep chrome, ochraceous, ocher yellow, olive ocher, or greenish olive, but toes sometimes olive buff or lemon yellow; claws black. *Adults, nuptial (dark phase):* Similar to light phase, but everywhere more deeply buff or cinnamonaceous; sides of head clay color or cinnamon. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but more deeply buff or cinnamon, thus more richly colored, feather edgings on upper parts much broader and often confluent. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by partial postjuvinal molt. Like juvenal, but slightly more worn, light margins of feathers, therefore, somewhat narrower; change to first nuptial takes place some time during winter. *Juvenal:* Acquired by complete postnatal molt. Light and dark color phases even more marked than in nuptial adults. Similar to adults, but colors of upper parts less sharply defined and feathers conspicuously but narrowly tipped with dull white, imparting scalelike appearance, mottlings on inner webs of wing-quills finer and less strongly contrasted. Bill dull olive green or dark olive brown, more brownish toward tip; iris hazel; legs and feet dull yellowish green or pale yellowish brown; claws black.

MEASUREMENTS: *Adult male:* Wing, 129.0–135.9 (average, 132.3) mm.; tail, 57.9–63.0 (60.7); bill (exposed culmen), 19.6–20.6 (20.1); tarsus, 29.9–37.1 (32.3); middle toe without claw, 20.1–21.6 (20.9). *Adult female:* Wing, 121.9–132.1 (127.5); tail, 54.1–62.0 (56.9); bill, 17.5–19.6 (18.3); tarsus, 28.9–31.0 (29.4); middle toe, 19.0–21.1 (20.1).

TEXAS: *Migration:* Collected north to Cooke, east to Chambers, south to Cameron, west to Webb (Aug. 25) and Midland cos.

MARBLED GODWIT, *Vetola fedoa* (Linnaeus)

SPECIES ACCOUNT

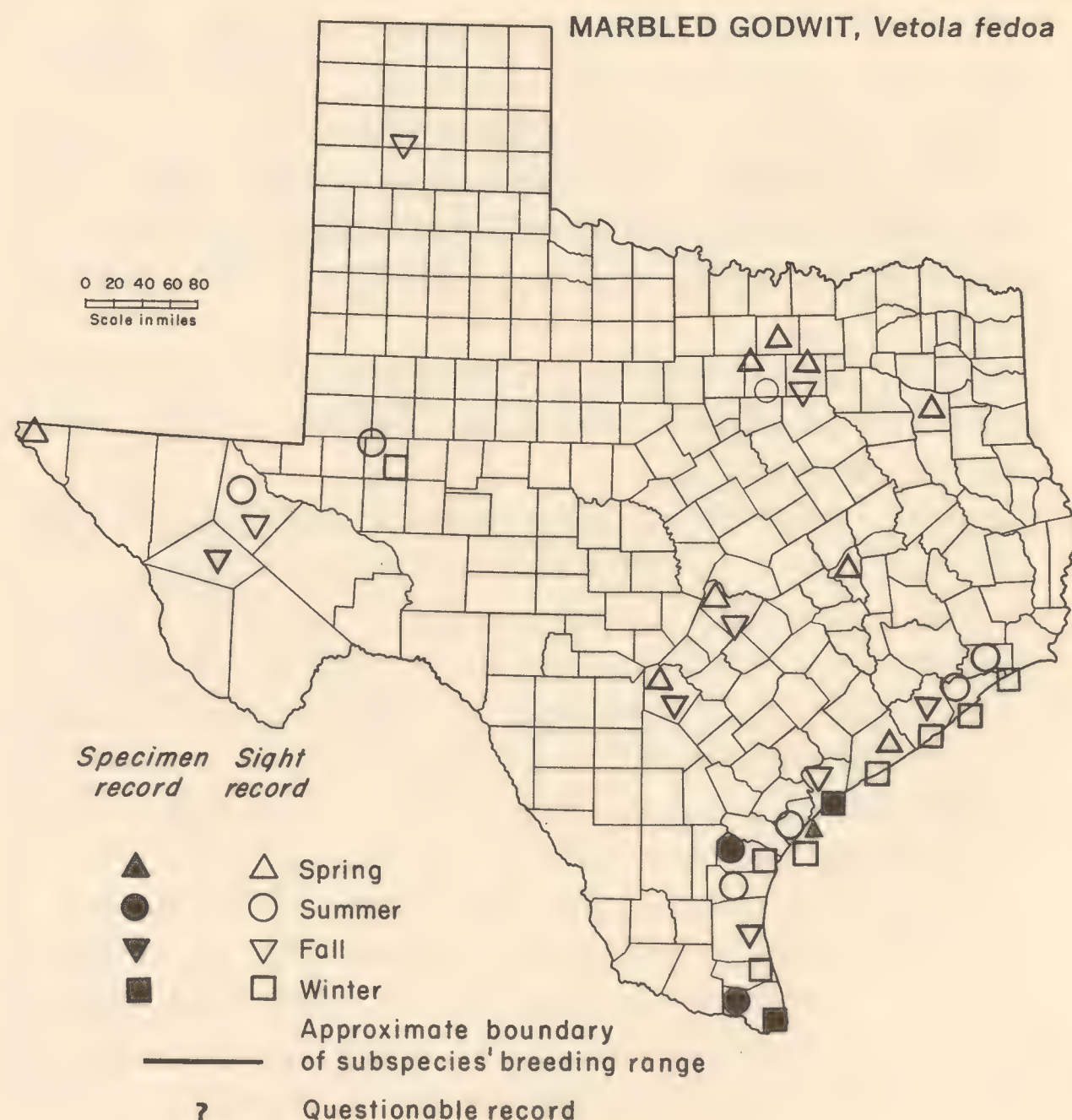
Limosa fedoa of A.O.U. check-list, 1957 (see Appen-

dix A). A large sandpiper, which has an extremely long, noticeably upturned bill. *Nuptial:* dark-mottled buffy brown above; finely barred buffy below; cinnamon wing-lining. *Winter:* more grayish; barring below reduced or absent. Length, 17¾ in.; wingspan, 31¼; weight, 12 oz.

RANGE: S. Alberta to s. Manitoba, south to c. Montana and w. Minnesota. Winters coastally from c. California to Chile, and from South Carolina to Honduras (rarely).

TEXAS: (See map.) *Migration:* Late Mar. to early May; mid-Aug. to late Nov. (extremes: early Mar., June 4; July 8, late Dec.). Irregularly common to uncommon along coast; rare through interior. Two mid-summer sightings: Aransas Co., Rockport (1 on June 29, 1947, R. W. Hill); Nueces Co., Nueces delta (1 on June 26, 1966, G. W. Blacklock). *Winter:* Early Nov. to late Mar. Locally common (some years) to scarce along coast. One mid-winter sighting inland: Midland Co., Midland (1 on Jan. 26, 1958, W. L. Ammon).

HAUNTS AND HABITS: The handsome Marbled Godwit breeds on open short-grass prairies of southwestern Canada and northern U.S. Great Plains—lands which have been increasingly converted to agriculture and other uses since the 1880's. Here the nest is hollowed in short grass, often near a stream or lake, with no attempt at concealment. In migration the species utilizes three major flyways—along California beaches, through the Mississippi Valley, and down the Atlantic coast; along the latter two routes, Marbled Godwit numbers have waned noticeably during the twentieth century, probably due to stress on the breeding grounds. In Texas, where its status was still fairly good as of 1972, the bird frequents Gulf and bay beaches, tidal flats, ponds, and marshes; a few transients seek comparable freshwater situations in the interior.



Flight of the Marbled Godwit is steady and moderately rapid; the head is pulled in a bit, the bill and legs extended. Loose companies migrate at times in irregular lines, but only briefly is any sort of formation maintained. The bird feeds primarily in shallow water near shore, often wading in up to its breast feathers. The long-legged godwit is usually the last shorebird driven from flats by incoming tides. It probes muddy bottoms, often completely inserting its bill, for worms, crustaceans, and small mollusks. Particularly on the grassy breeding grounds, various insects, especially grasshoppers, are a mainstay.

Vocalizations of this noisy species are various and distinctive. Flying about the nesting grounds, Marbled Godwits utter incessant notes—from a harsh one-syllable *kerk* to more expansive *ter-whit*, *ter-whit*, *ter-whit's*; *ker-rek*, *ker-rek*, *ker-rek's*; or *god-wit*, *god-wit*, *god-wit's*. The double-noted calls are heavily accented on the last syllable. When the bird is alarmed, calling is more intense and rapid. Infrequently sounded is a rather musical whistle varying from *kor-koit* to *ker-kor-koit*, *ker-koit*, with emphasis always on the *kor*. During its annual cool-season visit to Texas this bird is generally quiet.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts fuscous or fuscous black; pileum narrowly streaked with pale buff, hindneck much more numerous streaked, sometimes almost to the exclusion of drab areas; back, scapulars, and rump with bars or spots of light buff, cinnamon buff, or dull white; upper tail-coverts broadly barred with cinnamon buff or buffy white; tail cinnamon, somewhat paler terminally and on middle feathers, and numerous barred with fuscous; tips and outer webs of outermost primaries and primary coverts fuscous black, shaft of outermost primary yellowish white except at tip, others brown, inner webs of primaries and outer webs of inner primaries dull light cinnamon, mottled with fuscous, inner primaries tipped with buffy white; secondaries similar to inner primaries; tertials like scapulars; lesser wing-coverts fuscous, narrowly margined and tipped with pale buff and dull white; median and greater coverts like secondaries but paler dull cinnamon buff, much mottled with fuscous; lining of wing dull cinnamon with some fuscous markings; axillars narrowly barred with fuscous; superciliary stripe dull white, mixed with streaks or fine spots of fuscous; broad fuscous loreal stripe mixed with dull white; sides of head buffy or grayish white, very narrowly streaked with fuscous; sides of neck same but much more broadly streaked; chin buffy white or white; throat and jugulum pale buff, very narrowly streaked with fuscous; other lower parts dull cinnamon buff with irregular bars of fuscous on breast, sides, flanks, and crissum, but the last less marked and middle of abdomen practically plain; lining of wing dull cinnamon with some fuscous markings; axillars similar but narrowly barred with fuscous. Maxilla seal brown, paler in middle and black or blackish brown at tip, cutting edges at base and terminal third of mandible (except black tip) isabella color, basal portion yellowish white, reddish flesh color, pale vinaceous drab, or pallid vinaceous drab; tongue pinkish vinaceous; iris prout brown or burnt umber; legs and feet clove brown, fuscous, light drab, bluish gray, gray, or slate black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but with few or no dark markings on lower parts. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but with some retained feathers from first winter. *First winter:* Acquired by

wear from juvenal, from which it differs little, except by fading. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but cinnamon buff of upper and lower surfaces darker. Maxilla terminally clove brown, but culmen drab and basally olive or vinaceous drab; mandible terminally blackish slate, basally ecru drab or vinaceous pink; iris drab or broccoli brown; legs and feet olive gray or plumbeous, but soles of toes maize yellow; claws brownish black or slate black.

MEASUREMENTS: *Adult male:* Wing, 215.9–236.0 (average, 224.1) mm.; tail, 75.9–87.1 (81.8); bill (exposed culmen), 85.1–100.6 (93.7); tarsus, 67.1–74.9 (70.4); middle toe without claw, 33.0–37.1 (35.8). *Adult female:* Wing, 225.1–246.1 (232.4); tail, 73.9–91.9 (83.6); bill, 110.0–125.0 (117.6); tarsus, 71.9–79.5 (76.7); middle toe, 35.1–39.6 (37.6).

TEXAS: *Migration:* Collected along coast north to Aransas, south to Cameron cos. *Winter:* Three specimens: Calhoun Co., Indianola (Feb. 7, 10, 12, 1885, D. H. Talbot).

[BAR-TAILED GODWIT, *Vetola lapponica* (Linnaeus)]

Limosa lapponica of A.O.U. check-list, 1957. A mainly Old World godwit. Resembles Hudsonian, but has white rump, and narrowly black-barred white tail; lacks barring below. *Nuptial:* uniformly cinnamon buff below and on face; whitish wing-lining. *Winter:* lightly streaked on grayish breast; has narrower white wing-stripe. Length, 16 in.; weight, 11 oz.

RANGE: N. Scandinavia and n. Russia to n.w. Alaska. Winters coastally from British Isles, and North, Baltic, and Black seas to Gambia, Somali Republic, s.e. Asia, and Australasia.

TEXAS: *Hypothetical:* One careful sighting: n. Gonzales Co., beside U.S. Hwy. 183 near Palmetto State Park (female in prenuptial plumage, Apr. 9, 1967, C. R. Bender, David Wolf).]

HUDSONIAN GODWIT, *Vetola haemastica* (Linnaeus)]

SPECIES ACCOUNT

Limosa haemastica of A.O.U. check-list, 1957 (see Appendix A). A large sandpiper with long, noticeably upturned bill; in flight, conspicuous white wing-stripe, blackish underwing, and white at base of tail contrast boldly with black rump and black, narrowly white-tipped tail. *Nuptial:* dark brown (mottled) above; finely black-barred reddish brown below. *Winter:* brownish gray above; unmarked dull white below. Length, 15½ in.; wingspan, 26¾; weight, 9¾ oz.

RANGE: Locally from n.w. Mackenzie to Southampton Island and n.e. Manitoba. Winters in s. Chile, s. Argentina, and Falkland Islands.

TEXAS: (See map.) *Migration:* Late Apr. to late May; late July to late Sept. (extremes: Mar. 9, June 16; July 19, Oct. 21). Fairly common to uncommon in spring near Gulf coast; scarce to rare through remainder of eastern half; rare and local through western half. Rare and highly irregular in fall along coast; casual through interior.

HAUNTS AND HABITS: The Hudsonian Godwit is rare in terms of total world population, but healthy flocks of springtime migrants on prairies, particularly in Texas, give the impression that the species is viable. A hollow cup in grass on open tundra, often near water, suffices for its usual four-egg clutch. The normal fall route from Canada to South America is over the Atlantic, well offshore, although a few birds are blown to the U.S. coast in severe storms. During spring migration most Hudsonians return to the breeding grounds via the Mississippi Valley and Great Plains. In Texas this northward movement reaches its peak during the first three weeks of May. Migrants tarry to feed and rest in tidal marshes and on sandbars of river mouths; inland they appear locally, but frequently, in rice fields and mud flats and shallows of prairie lakes and pools. When a rainy norther occurs in late spring it may ground hordes of migrating birds of many species. On such occasions, the present godwit may linger for one or two days around rain ponds and puddles in meadows and plowed fields, with White-rumped and Stilt sandpipers and other waders.

Hudsonians are strong and swift on the wing; they are capable of long-sustained flight as their extended migrations would suggest. This long-legged, large-bodied bird spends most of its time walking deliberately along shores—not altogether gracefully—or wading in shallows, sometimes up to its breast feathers. Like most waders, it swims with ease when the occasion demands. With rapid thrusts of its recurved bill, it probes sand and muddy bottoms for worms, mollusks, crustaceans, and other forms of aquatic life; insects, especially horseflies and mosquitoes, are eaten also.

The Hudsonian is unusually silent for a shorebird, particularly away from the breeding ground; *qua qua*

and *ta-it* are standard descriptions of its low, seldom heard notes.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts black or fuscous black; forehead sometimes dull white, hindneck broadly streaked with pale dull buff, cinnamon buff, or buffy white; back and scapulars with spots and irregular incipient bars of same color; rump clove brown, very obscurely edged with paler brown; shortest upper tail-coverts white, longest, black with narrow white tips; tail fuscous black, base of all but central pair of feathers white, and with more or less conspicuous white tip; primaries fuscous, lighter on inner webs, shafts of feathers mostly yellowish white; secondaries hair brown, paler on inner webs; tertials fuscous black with marginal spots or edgings of white and cinnamon buff; inner primary coverts tipped with white; anterior lesser wing-coverts fuscous; remainder of wing-coverts hair brown with darker centers; broad superciliary stripe buffy white somewhat mixed with flecks of fuscous; sides of head same, more strongly streaked with fuscous and with ill-defined loreal line of fuscous streaks; chin buffy white with very fine spots of fuscous; foreneck dull cinnamon buff, numerous streaked and spotted with fuscous; breast and abdomen light russet or mikado brown, numerous barred with fuscous or fuscous black, these bars mostly narrow except on flanks; crissum white, anteriorly washed with color of breast and somewhat barred with dull black; lining of wing partly fuscous black and hair brown, feathers mostly edged or tipped with white. Bill grayish yellow, tip dull black, edges of mandible dark brown, or bill black with basal half of mandible and cutting edges of maxilla light salmon color (in nuptial season, base of bill becomes bright orange); iris prout brown; legs and feet light bluish gray or black. *Adults, winter:* Acquired by complete postnuptial molt. Above almost unmarked brownish gray, feathers with obscure darker shaft streaks; rump fuscous, shortest upper tail-coverts white, longest upper tail-coverts dull black; tail fuscous black with white base and tip; lower parts dull white or buffy white, shaded across breast with light drab but without streaks or bars. Tip of bill olivaceous black, but culmen and base of maxilla wood brown or salmon color, rest of bill buff or flesh color; tongue salmon color; iris deep olive brown; legs dark greenish olive. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but some of first winter plumage is retained. *First winter:* Acquired by partial postjuvinal molt. Similar to adults in winter, but distinguishable by retained juvenal wing-coverts. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter but darker above, crown more blackish, feathers of mantle with conspicuous dull cinnamon edges, scapulars and tertials tipped with same color; lower surface more washed with buffy gray. Bill purplish flesh color; iris deep brown, almost black; feet and legs dull blue-gray.

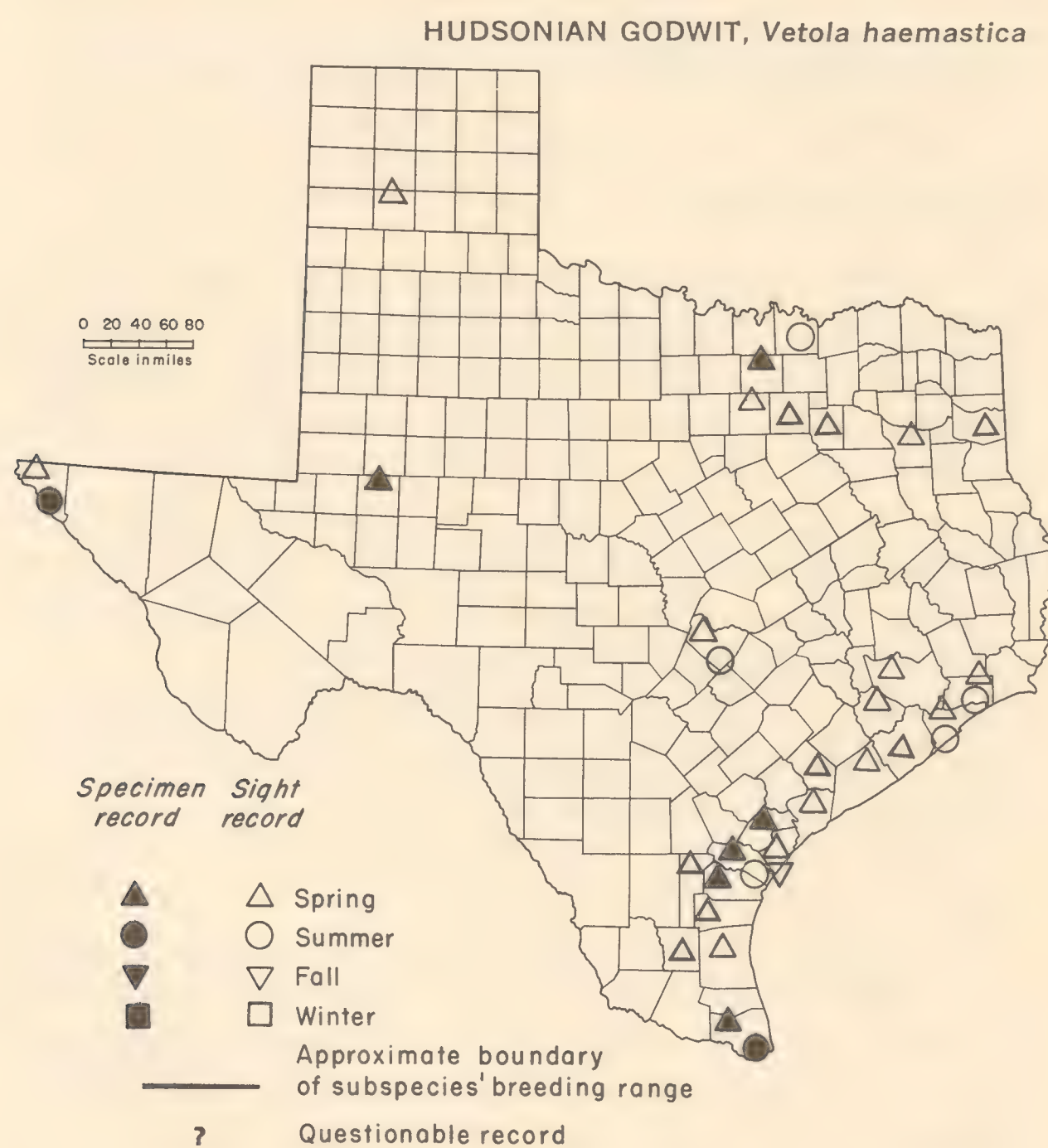
MEASUREMENTS: *Adult male:* Wing, 196.1–212.1 (average, 204.7) mm.; tail, 71.1–81.5 (74.2); bill (exposed culmen), 68.1–81.5 (73.7); height of bill at base, 9.4–11.9 (10.7); tarsus, 55.6–59.4 (57.2); middle toe without claw, 29.9–32.0 (30.7). *Adult female:* Wing, 208.0–225.0 (214.9); tail, 71.9–82.0 (76.7); bill, 80.0–95.5 (87.6); height of bill, 11.4–12.4 (11.9); tarsus, 59.4–65.0 (62.7); middle toe, 29.9–34.5 (32.3).

TEXAS: *Migration:* Collected north to Denton, south to Cameron, west to Midland and El Paso (July 27) cos.

RUFF, REEVE, *Philomachus pugnax* (Linnaeus)

SPECIES ACCOUNT

A Eurasian sandpiper intermediate in size between Greater and Lesser yellowlegs, but browner and with-



out white speckles; base of bill and legs (usually) yellowish or greenish. In flight, shows large, white oval patch on each side of dark brown tail; thin white line on wing. *Ruff (male)*: shows great variation in color and pattern of nuptial ruff, elongated ear-tufts, and upper parts; has white belly and crissum, the latter vaguely spotted. *Reeve (female)*: smaller; lacks ruff, ear-tufts. *Winter adult and immature* (plumages usually seen in New World): brown above with black mottling (adult shows dull white on extreme forehead); white or whitish below with black-flecked brown of breast and sides varying to ash brown wash. Length, 12¼ in. (male), 10 (female); wingspan, 23¾ (male), 21 (female).

RANGE: Palaearctic, south to n. Europe and s. Siberia, locally in w. France and Hungary. Winters from England, Mediterranean regions, India, and Thailand to South Africa. Casual in Iceland, Greenland, Atlantic and Gulf coasts of North America, and West Indies; accidental in Alaska.

TEXAS: *Casual*: Oct. 19 to Apr. 29. One specimen: Cameron Co., s. Padre Island (skin label reads "female, Dec. 10, 1902, F. B. Armstrong"; identification confirmed in 1971 at the U.S. National Museum by R. C. Banks and R. B. Clapp). Several careful sightings along coast: Nueces Co., Oso area of Corpus Christi (adult male in winter plumage, Oct. 19, 1968–Jan. 11, 1969, H. L. Patten, Kay McCracken, A. W. O'Neil, T. S. Schulenberg, et al.; substantiated by color photographs); Nueces Co., Oso area of Corpus Christi (male in winter plumage, Oct. 26–late Nov., 1969, David Simon); Aransas Co., near Rockport (male, Apr. 7–8, 1960; female, Apr. 12–15, 1960, Connie Hagar, Jack Stevens, et al.); Galveston Co., Galveston Island (male, Apr. 28, 1968, Joe Farrell, W. C. Mebane, Noel Pettingell, S. G. Williams; on Apr. 29, adult male "about to change from winter to breeding plumage" observed less than 1 mi. from previous day's sighting, G. G. Williams).

HAUNTS AND HABITS: Currently, *Philomachus pugnax* is the only avian species without an English name to cover both sexes. The male is Ruff; the female, Reeve. The bird is outstanding in another respect: The male in spring plumage is a rare example of individuality in the wild animal world; two Ruffs seldom display the same coloration or pattern on their elaborate nuptial collars and ear-tufts.

This peculiar Old World sandpiper breeds in northern Eurasia and winters as far south as southern Africa. In northern Europe the nest is concealed in thick grass on marshes, fens, and damp meadows; in arctic climes, it is not so well hidden amid moss, lichens, and other sparse tundra vegetation. The bird's casual North American appearances, including those in Texas, have been chiefly in coastal situations about ponds, salt marshes, and channel banks.

Flight is rapid, strong, and performed with regular wing-beats; the bird at times glides briefly. This short-billed, medium-sized wader walks deliberately about meadows or on flats. At shoreline and in shallow water it probes mud for crustaceans, mollusks, and worms;

in grassy meadows and mowed fields, chiefly during the breeding season, it catches grasshoppers, mayflies, bugs, beetles, and a variety of other insects, and eats a few seeds or bits of algae.

The species is promiscuous. Like the Greater and Lesser prairie chickens, each Ruff establishes a station on the communal display grounds and attracts Reeves with his nuptial performance. Stationary, or charging a few steps, he expands his ruff, wings, and tail, ruffles his feathers, and shivers his wings; sometimes he crouches with bill to the ground. Males scuffle with each other (hence the colloquial name "fighting sandpiper"); however, most battles are feigned. A Reeve usually mates with several males, but sometimes she ignores the advances of all but one particular Ruff. The Reeve alone takes care of incubation and tends the young after they hatch.

Philomachus pugnax is rather silent. Birds sometimes utter *tu-whit* when flushed; in flight, a louder *teuuuu-i-toi* is occasionally sounded. Out-of-pocket individuals that wander to North America tend to be especially silent.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Pileum exceedingly variable, white or buffy white flecked with hair brown, chestnut, violet black, or greenish black; hindneck chestnut or dull white, immaculate or finely mottled or broadly barred with black or metallic violet black, or chestnut mixed with metallic violet and fuscous black; mantle either mostly gray mixed with buff and with a few large black spots often with metallic violet sheen, or mostly black with mixtures of buffy brown, edgings and spots of chestnut, and mottlings of fuscous, or mixed with metallic black and blackish purple feathers; rump fuscous, broadly edged with drab; upper tail-coverts centrally like rump, laterally white; tail hair brown, mostly unbarred, but middle two or three pairs of feathers fuscous black and irregularly barred, particularly on terminal portion, with drab to cinnamon; primaries fuscous or fuscous black, shafts mostly dull white; secondaries hair brown, becoming paler on inner webs and whitish at base; lesser wing-coverts hair brown, tipped with paler brown, and some coverts often finely vermiculated with buffy white and dull black, some middle and greater coverts spotted or barred with fuscous black, cinnamon, or tawny, and only greater coverts tipped broadly with white or buffy white; throat, ruff, and ear-tufts varying greatly in color (from white to purplish black and through many degrees of brown) and pattern (from plain to finely or coarsely spotted, streaked, or barred); breast and sides white with broad black or fuscous markings, or metallic violet black with a few edgings of dull white, sometimes cinnamon or chestnut; remainder of lower surface white; lining of wing white with very few spots of hair brown. Bill blackish brown, base flesh color; iris dark brown; legs and feet greenish yellow, orange-yellow, or yellowish brown. *Adult male, winter:* Acquired by complete postnuptial molt. Extreme forehead dull white; crown dull dark hair brown with broad brownish pale neutral gray edgings; hindneck almost plain brownish neutral gray, posteriorly centers of feathers darker; mantle similar, with fuscous black or fuscous centers of feathers and very narrow pale grayish white tips; rump and upper tail-coverts similar; tail as in nuptial adult male; greater wing-coverts and secondaries hair brown; median and greater coverts with subterminal darker area and broad white tips, secondaries becoming white on basal portion of inner web; no conspicuous superciliary stripe; sides of head and neck like hindneck, former much flecked with dull white; lower parts white, breast spotted with drab; remainder of lower

parts white. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but much smaller; ruff entirely lacking; pileum, hindneck, and mantle fuscous black or dull black, edgings of last light buffy brown; rump, upper tail-coverts, and tail similar to those of nuptial adult male; tertials fuscous black, barred with cinnamon; anterior lower parts similar to upper parts; edgings of feathers on breast broader; sides of body similar; middle of breast and abdomen, with crissum and lining of wing, white, outer wing-coverts with obscure hair brown markings. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to adult male in winter but much smaller. *Male, second nuptial*: Acquired by partial prenuptial molt. Practically identical with nuptial adult male. *Male, second winter*: Acquired by complete postnuptial molt. Similar to adult male in winter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male, but ruff rudimentary or absent; upper parts lighter, more brownish, and with many narrow bars or small spots of buff, thus less solidly black; lower parts, particularly breast, similarly not so heavily marked with black. *Female, second nuptial*: Acquired by partial prenuptial molt. Like nuptial adult female and, like it, much smaller than second nuptial male. *Female, second winter*: Acquired by complete postnuptial molt. Essentially identical with adult female in winter. *Female, first nuptial*: Acquired by partial prenuptial molt. Intermediate between adult female in winter and nuptial adult female; upper parts much mixed with large and small spots of dark brown or brownish black, light-colored jugulum, breast, and sides likewise mixed with black or dark brown spots, but whole plumage very much lighter in appearance than is nuptial adult female. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to corresponding sex of adults in winter, but with some scapulars and some of innermost secondaries retained from juvenile, these brownish black with edges of buff; margins on median wing-coverts buff. *Juvenal*: Acquired by complete postnatal molt. Similar to corresponding sex of adults in winter, but strongly suffused with buff on upper parts, and all feathers with buff, cinnamon buff, whitish, or tawny edgings and tips; breast and sides of neck light dull cinnamon buff; remainder of lower parts white or buffy white.

MEASUREMENTS: *Adult male*: Wing, 171.4–186.2 (average, 181.8) mm.; tail, 65.0–70.1 (68.1); bill (exposed culmen), 33.0–35.6 (34.5); tarsus, 47.0–52.6 (50.0); middle toe without claw, 31.0–34.0 (32.3). *Adult female*: Wing, 148.1–153.9

(151.4); tail, 52.1–58.4 (54.8); bill, 29.4–32.0 (31.0); tarsus, 38.6–42.9 (40.6); middle toe, 26.9–28.9 (28.2).

TEXAS: *Winter*: One specimen (see species account).

SANDERLING, *Crocethia alba* (Pallas)

SPECIES ACCOUNT

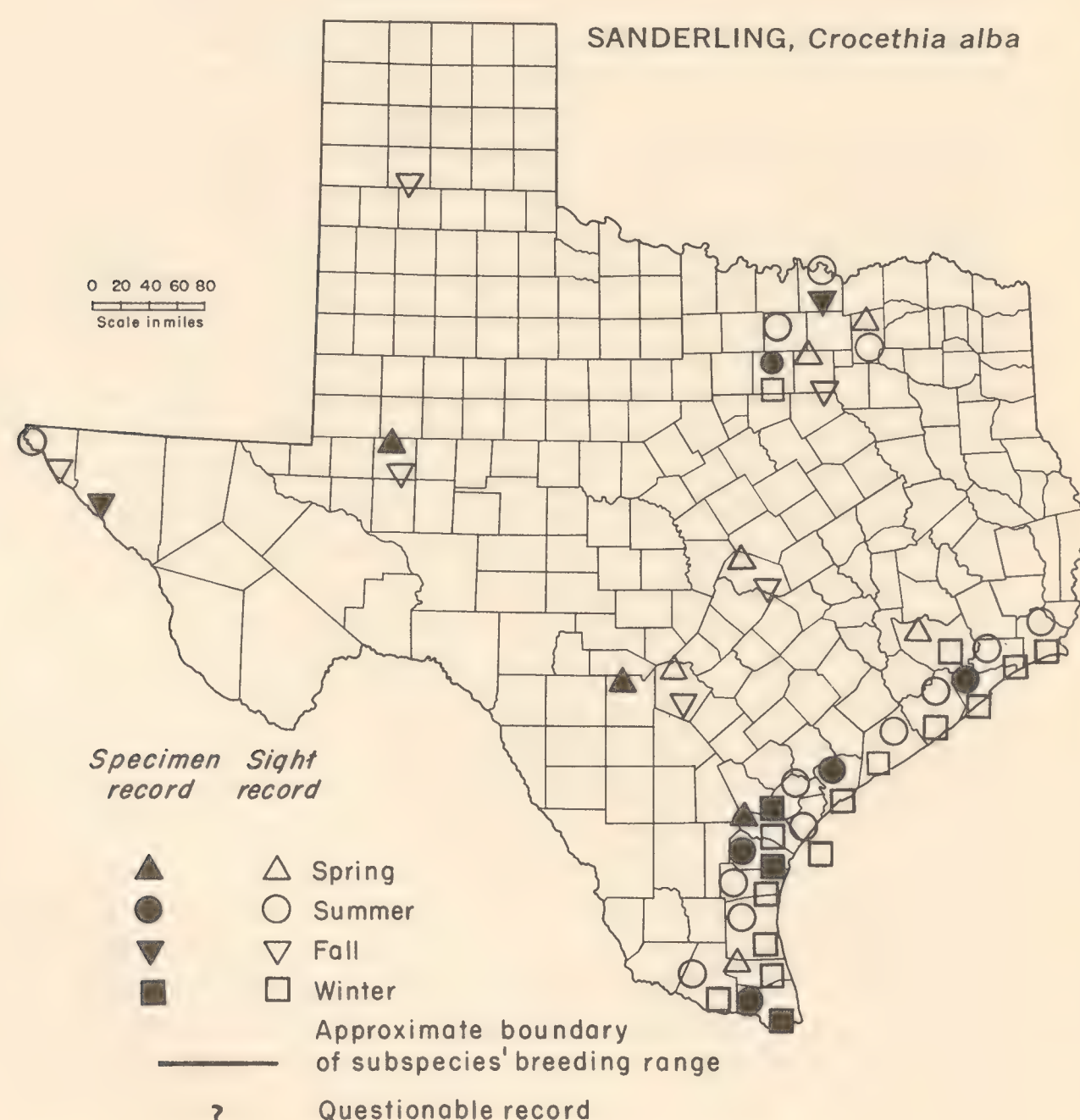
A plump, energetic sandpiper of sea beaches, where it chases retreating surf; has rather stout black bill and legs; in flight, long white wing-stripe contrasts boldly with dark wing. *Nuptial*: cinnamon head, back, and breast; mostly white below. *Winter*: palest sandpiper; light gray above; entirely white below; dark shoulder-patch. Length, 8 in.; wingspan, 15¾; weight, 2¼ oz.

RANGE: Circumpolar in Arctic. Nonbreeders summer widely coastally, chiefly in Northern Hemisphere. Winters coastally from approximately lat. 50° N. to 50° S.; in Western Hemisphere, from s. British Columbia to Chile, and from Massachusetts to s. Argentina.

TEXAS: (See map.) *Migration*: Late Mar. to late May; late July to early Nov. (extremes: Mar. 8, June 11; July 24, Dec. 8). Very common to common along Gulf coast; uncommon to scarce and local inland, but absent from most of extreme southwestern portion and eastern quarter. Nonbreeders regularly oversummer along coast. *Winter*: Early Nov. to late Mar. Very common to common along coast.

HAUNTS AND HABITS: The pale, plump, nimble Sanderling is well named. It, probably more than any other bird, spends most of its foraging life running on surf-washed sand. On high, dry tundra, barren or rock strewn, this sandpiper hollows a shallow nest cup in or near a clump of vegetation, which it then lines with withered leaves. Wintering birds, migrants, and nonbreeders, often in force, occur on virtually every open sandy beach in the Northern Hemisphere and some in the Southern Hemisphere. It is amazing that the Sanderling can maintain its numbers with so many individuals far removed from the nesting grounds during the breeding season. In Texas, where they wear every gradation from full winter to full summer plumage, Sanderlings scurry at water's edge on Gulf beaches, bays, and lagoons; a few migrants occur locally inland, chiefly on sewage evaporation ponds, where ordinarily they don't tarry long. Large, but scattered, feeding parties often include small numbers of other sandpipers and the Black-bellied Plover.

As befits a great migrant, Sanderling flight is powerful and swift. Watching a feeding Sanderling is a delight to human beach visitors. Like a wind-up toy, the bird skitters behind retreating surf; as it advances on watery, salty sand, it quickly picks up tiny shrimp, other crustaceans, small mollusks, and marine worms before an incoming wave forces its withdrawal on legs that twinkle with speed. If lapped by foam, the Sanderling usually flutters above it. As the bird probes wet sand for sand fleas and other insects, its bill leaves distinctive pocks (often double-holed, indicating it inserts the bill partially opened) in lines or



arcs, sometimes so close together as to form a furrow. Early in the breeding season, when animal protein is unavailable or scarce, these birds eat buds of saxifrage and other plants, also moss and algae. Groups of resting Sanderlings—practically disappearing into their sandy surroundings—stand (some on one leg) or squat on the beach or a low dune, where generally they face into the sea breeze.

Sanderlings are rather quiet. The common note heard on beaches around the world is, however, distinctive—a short *twick* or *quit*; this is heard chiefly when birds flush. Individuals softly twitter in feeding flocks.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Pileum and hindneck dull cinnamon rufous or cinnamon buff, mixed with dull white on forehead, elsewhere spotted and streaked with fuscous black; back and scapulars fuscous black with broad edgings of tawny or cinnamon, also some tips of white on feathers; rump hair brown, feathers tipped with white; middle longest lower tail-coverts chaetura black or chaetura drab, lateral feathers white; tail light drab, middle feathers chaetura black terminally, outermost feathers white on basal portion of inner webs, and with white shaft streaks; wing-quills fuscous black, paler on inner webs, shafts white; secondaries chaetura drab or dark hair brown, innermost feathers chiefly white, particularly on inner webs and at base; tertials fuscous, margined with dull white; wing-coverts fuscous to hair brown, posterior lesser coverts and middle coverts much edged with grayish white, greater series broadly tipped with white; sides of head and of neck like pileum, much spotted with fus-

cous and hair brown; chin and throat same; remainder of lower parts white; lining of wing white, outer under wing-coverts mottled with hair brown. Bill, legs, and feet black; iris dark brown. *Adults, winter:* Acquired by complete postnuptial molt. Forehead white; remainder of upper surface almost uniform, pale to very pale brownish gray, this lightest on nape, darkest on mantle and middle upper tail-coverts; sides of head and of anterior neck with entire lower parts pure white; but eye-ring and region below and extending behind eye very narrowly streaked with brownish gray; wings as in nuptial adults, but tail with more white on lateral feathers. Bill, legs, and feet as in nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but tertials shorter, not reaching to tip of fourth primary when wing is closed; tertials and wing-coverts in part retained from first winter. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but feathers of rump and some of tertials and wing-coverts retained from juvenile. Bill, tongue, iris, legs, feet, and claws black. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adults, but lacking tawny or cinnamon tints; forehead white; hindneck grayish or buffy white, very narrowly and obscurely streaked with fuscous; back and scapulars brownish black, spotted with white; entire lower surface white; jugulum and sides of neck sometimes washed with pale buff. Bill and feet black; iris brown.

MEASUREMENTS: *Adult male:* Wing, 113.0–124.5 (average, 119.4) mm.; tail, 45.0–55.1 (50.3); bill (exposed culmen), 23.1–25.9 (24.6); tarsus, 23.1–24.9 (23.6); middle toe without claw, 14.5–16.0 (15.5). *Adult female:* Wing, 117.1–127.0 (123.0); tail, 47.5–54.6 (52.8); bill, 23.9–27.9 (25.9); tarsus, 23.1–25.9 (24.6); middle toe, 16.0–17.0 (16.3).

TEXAS: *Migration:* Collected north to Grayson, east to Galveston, south to Cameron, west to Medina and Hudspeth cos. *Winter:* Taken along coast northeast to Calhoun (Mar. 30), southwest to Cameron cos.

Avocets and Stilts: Recurvirostridae

AMERICAN AVOCET, *Recurvirostra americana* Gmelin

SPECIES ACCOUNT

A large, long-necked wader, boldly patterned black and white, with long, thin, decidedly upcurved black bill; very long, slender, pale blue legs. *Nuptial*: cinnamon buff head, neck, and breast. *Winter*: pale gray head and neck; white breast. Length, 17¾ in.; wingspan, 32¼; weight, 14 oz.

RANGE: E. Washington, s. Idaho, c. Alberta, and s. Manitoba, south to s. California, n. Utah, s. New Mexico, San Luis Potosí (local), Panhandle and coastal Texas, and w. Oklahoma. Winters mainly from California, extreme s.w. Louisiana, and coastal Texas to Guatemala, rarely to Honduras.

TEXAS: (See map.) *Breeding*: Early May to early Aug. (eggs, May 6 to July 13) from near sea level to about 4,600 ft. Fairly common to scarce and local in Panhandle south to Midland and Abilene; uncommon to scarce and irregular along central and lower coasts; rare on upper coast. *Migration*: Late Mar. to late May; mid-July to mid-Nov. (extremes: Mar. 1, June 21; July 4, Jan. 1). Abundant to fairly common along coast; common locally to scarce inland. *Winter*: Nov. to Mar. Very common locally to uncommon along coast; scarce inland in Rio Grande delta.

HAUNTS AND HABITS: Conclaves of American Avocets can hardly be overlooked in Gulf bays and lagoons or shallows of inland lakes. This species and the Black-necked Stilt are the only birds of the seven-member world family, Recurvirostridae, found in North America; both occur in Texas. Shores of salt and alkaline lakes, particularly of the Great Basin area, constitute the chief breeding habitat of the avocet in the United States. In Texas, however, it nests locally on shores of inland playa lakes and along the Gulf coast. Avocets also winter along the coast; throughout the state, migrants rest and feed in damp meadows and on margins of lakes, pools, and watercourses, fresh, alkaline, or salt.

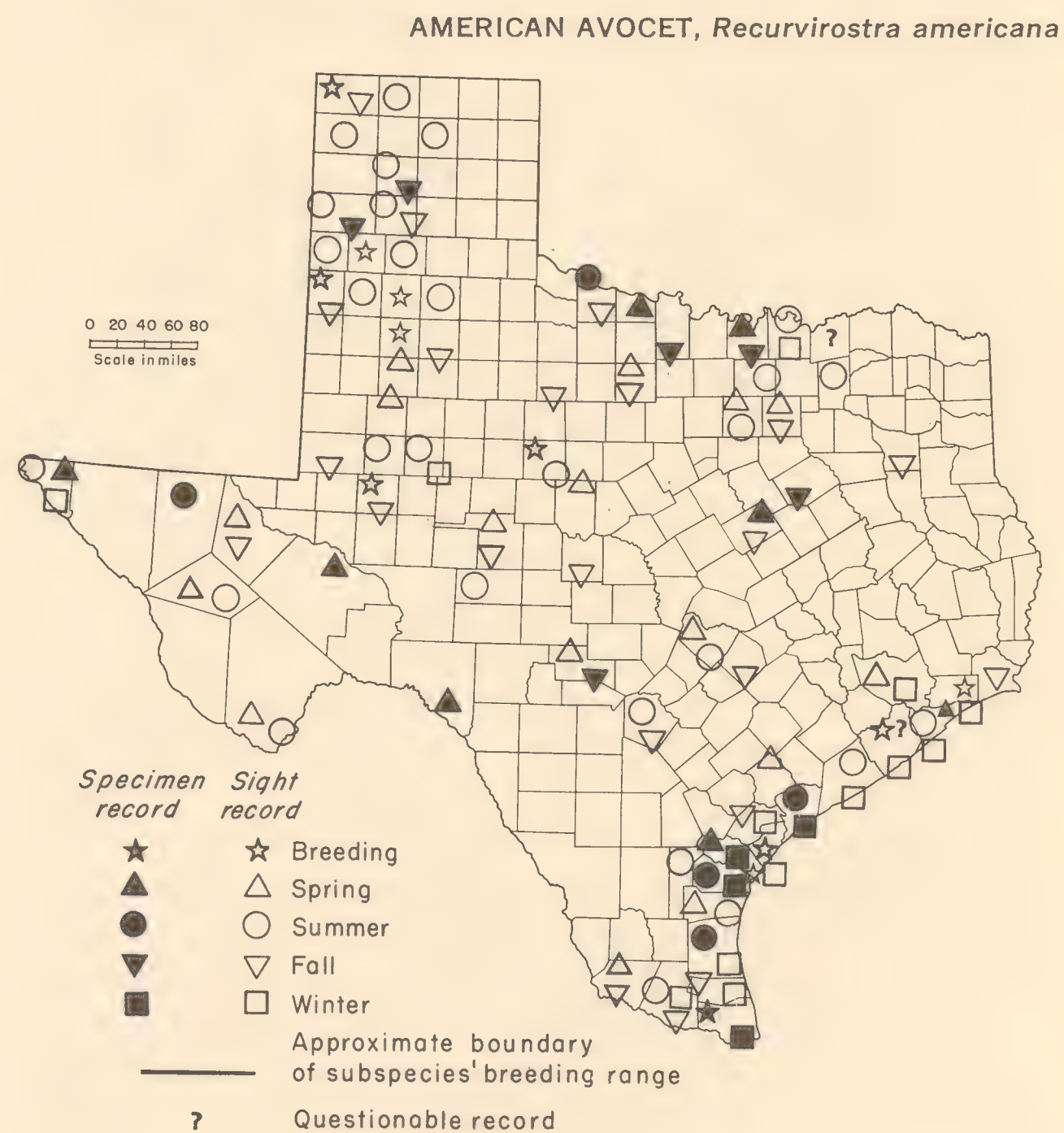
In flight, the American Avocet is steady and direct and, in this respect, resembles the Greater Yellowlegs. When alighting on the ground, it typically raises its wings straight over its back before folding them. As it feeds, this long-legged bird walks rapidly on mud or

sand flats and in shallow water. In deep water it sometimes floats, swimming easily with its webbed feet and tipping up at times like a puddle duck. *R. americana* swings its recurved bill—mandibles slightly open—in a horizontal arc through the water, and in the sweeping action, picks up shrimp, other crustaceans, a few fish, and other living or recently dead aquatic organisms. Insects are skimmed off the surface. A few seeds of water and marsh plants are eaten as well.

In the breeding season, noisy American Avocets, in alarm or protest, repeatedly utter yelping *wheep*'s (also described as *wheek* or *kleep*); individuals also exchange softer, more conversational *whuck* or *whick* notes.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Forehead and orbital region buffy white; remainder of head and all of neck light cinnamon; back, rump, upper tail-coverts, and outer scapulars white; inner scapulars and lateral feathers of back fuscous black; tail grayish white or



very pale gray, inner webs of outer feathers white; primaries and primary coverts fuscous black, inner webs fuscous; secondaries fuscous black or fuscous, inner webs partly white and increasing until inner secondaries are entirely white, others edged and tipped with white; tertials light fuscous or drab; wing-coverts fuscous black or chaetura black, greater series broadly tipped with brownish white or pure white; jugulum and breast light pinkish cinnamon or vinaceous buff; remainder of lower parts white; lining of wing all white. Bill black, sometimes with base of mandible dark brown; iris argus brown, auburn, prout brown, burnt umber, or red; tip of tongue black; legs and feet pearl blue, russian blue, light columbia blue, but tarsus in front sometimes pale russian blue or sky gray; edges of webs between toes flesh color; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but anterior upper parts pale smoke gray, entire under surface white. *Second winter*: Acquired by complete postnuptial molt. Like adults in winter. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but primaries worn; some scapulars and wing-coverts retained from juvenal. *First winter*: Acquired by partial postjuvinal molt and wear from juvenal. Similar to adults in winter, but differs in many retained juvenal feathers. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but sides and back of neck tinged with light cinnamon, longest scapulars and tertials with buff or buffy white edgings. Bill slate color, becoming slate black at tip and sometimes olive brown at base; iris mummy brown; tarsus french gray, sometimes washed with yellow in front; toes and joints plumbeous; webs of toes french gray; claws brownish black tipped with plumbeous. *Natal*: Upper surface mixed cinnamon buff, cream buff, and grayish buff, spotted with gray and dark brown, and with narrow irregular stripes brownish black, crown rather paler and indistinctly spotted with dark brown, rump darker; narrow loreal stripe black; under surface buffy white, paler on throat and abdomen. Bill black; legs and feet light blue.

MEASUREMENTS: *Adult male*: Wing, 215.1–239.0 (average, 225.3) mm.; tail, 78.0–89.9 (84.8); bill (exposed culmen), 87.9–101.1 (94.2); tarsus, 88.4–106.9 (98.1); middle toe without claw, 38.6–44.2 (41.4). *Adult female*: Wing, 212.1–230.1 (220.2); tail, 78.0–87.9 (83.3); bill, 79.5–93.0 (85.1); tarsus, 85.6–101.1 (93.7); middle toe, 37.1–43.9 (40.4).

TEXAS: *Breeding*: Collected along coast northeast to Calhoun, southwest to Cameron cos.; no specimen, but also nests in Panhandle (see species account). *Migration*: Collected north to Deaf Smith, Potter, and Wichita, east to Fannin (ca. 1885), Navarro, and Galveston, south to Cameron, west to Val Verde and El Paso cos. *Winter*: Taken along coast northeast to Calhoun, southwest to Cameron cos.

NESTING: *Nest*: In grassy meadows, on alkali flats, or in marshes of lakes or bays; on bare mud or sand, amid grass, bushes, or weeds; composed of sticks, weed stalks, bones, and various other rubbish; lined with grass and weed stalks. *Eggs*: 3–8 (larger number possibly product of two females), usually 4; ovate pyriform to ovate; smooth but not glossy; isabella color to deep olive buff; with numerous spots of various shades of brown, such as sepia and bister, sometimes with a few blackish lines, and numerous shell markings of different shades of drab; average size, 49.8 × 34.0 mm.

BLACK-NECKED STILT, *Himantopus mexicanus* (Müller)

SPECIES ACCOUNT

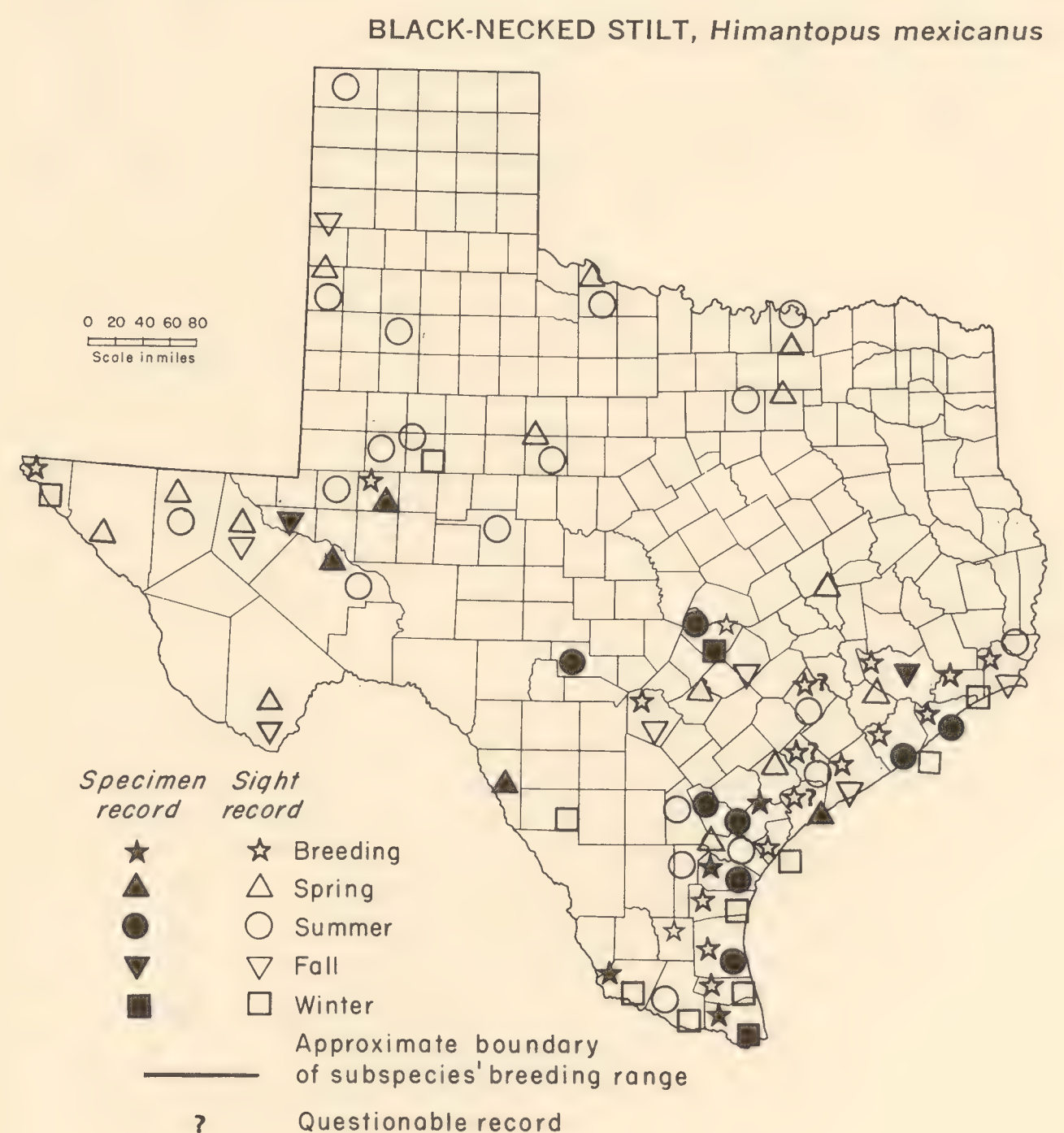
A rather large, trim, long-necked wader, essentially solid black above and pure white below, with long, slender, straight black bill; extremely long, thin red legs that in flight extend far beyond white rump and whitish tail; white forehead and eyebrow-spot; red

eyes. Female is slightly duller above. Length, 14¼ in.; wingspan, 27¼; weight, 5½ oz.

RANGE: Local: w. United States, n. Gulf coast, and s. U.S. Atlantic coast, south through coastal lowlands—much more local through interior—to n. South America; a well-marked race in Hawaii. Largely resident south of United States; winters mainly from s. California and s. coastal Texas, southward.

TEXAS: (See map.) *Breeding*: Mid-Apr. to mid-Aug. (eggs, Apr. 16 to June 28; downy chicks as late as Aug. 1) from near sea level to about 4,000 ft. Common locally to fairly common along coast; locally and irregularly fairly common to scarce in northwestern Trans-Pecos and in vicinity of Midland; scarce and highly irregular inland in south Texas north to San Antonio, rarely to Austin. *Migration*: Mid-Mar. to mid-May; late July to mid-Oct.—a few into Dec., especially along coast (extremes: Mar. 2, early June; early July, Jan. 1). Common along coast; fairly common to scarce through much of interior southwestern third; rare to casual through southern Trans-Pecos, Panhandle, and remainder of north central and central portions; virtually absent from wooded eastern quarter. *Winter*: Mid-Jan. to late Feb. Fairly common to uncommon in Rio Grande delta (chiefly along coast); scarce north to central coast; rare on upper coast. One Feb. record from interior: El Paso Co., near El Paso (Feb. 11, 1938, Lena McBee).

HAUNTS AND HABITS: In warm months, pairs of trim Black-necked Stilts wade daintily about wet prairies and ponds, chiefly fresh and brackish ones along the Gulf coast. Inland in Texas, a few individuals haunt fish hatcheries, sewage ponds, and shores of artificial lakes. The present species is considerably less attracted to salt or alkaline wetness than is the American Avocet.



Migrants linger about playa lakes, ponds, water holes, and rice fields on prairies and plains, also along rivers and creeks. On the wing, it flocks with its fellows; when feeding, it mingles with other shorebirds, such as yellowlegs, various other sandpipers, and the American Avocet.

Flight of the streamlined Blackneck—bill straight out and long, red legs extended—is steady and direct, although not particularly swift. Bending its stilt legs with each step, this bird gracefully strides along muddy or sandy margins of a pond in search of snails, bugs, beetles, dragonflies, mosquito larvae, grasshoppers, and other insects. In shallows it wades, often to breast-height, where it picks insects off the surface with its long bill and lightly probes the muddy bottom for crayfish, brine shrimp, and a few small fish. Though capable of swimming and diving, the Blackneck rarely resorts to either activity; its long legs and almost web-less feet are best used for wading.

Stilts are quite noisy and restless on the breeding grounds. When alarmed, they sound sharp *pep, pep, pep*'s which rise in pitch to frenzied *yip, yip, yip*'s. Typically when giving these calls, parent birds are either circling over an intruder's head or else they are down in the marsh appearing very crippled, wounded, or sick. This injury feigning probably distracts some predators away from eggs or young; certainly it informs the naturalist that nesting activity is going on.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Top and sides of head, hindneck, back, scapulars, and upper surface of wings black, wings with strong metallic olive green or dark green sheen on exposed surface of feathers; tail pale gray, inner webs of outer feathers white; forehead, spot above eye, and streak on lower eyelid, together with rump, upper tail-coverts, and entire lower surface, pure white. Bill black; eye-ring black; iris carmine, scarlet vermilion, or scarlet red, or with grayish brown border next to pupil and wider outer ring carmine; legs and feet light rose pink, light carmine, peach blossom pink, geranium pink, or lake red, but

soles of toes flesh color; claws black or black-tipped with dark brown. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by partial prenuptial molt. Like nuptial adult male, but back, scapulars, and tertials fuscous or olive brown; black of other portions of plumage duller. *Male and female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but some juvenal wing-coverts retained. *Male and female, first winter:* Acquired by partial postjuvenal molt and wear from juvenal. Similar to adult female in winter but duller, black areas somewhat more brownish, and many feathers retained from juvenal. *Juvenal:* Acquired by complete postnatal molt. Like nuptial adult female, but back, scapulars, and tertials broadly margined with dull buff or clay color, crown and hindneck spotted and streaked with same, inner wing-coverts with some buffy or ochraceous edgings. Bill black, but base of maxilla bone brown, base of mandible army brown; eye-ring black; legs and feet posteriorly shrimp pink, anteriorly pink washed with blue; joints pearl blue; claws brownish black. *Natal:* Upper surface light grayish buff, hindneck almost immaculate, pileum, back, and rump much mottled with black of which there are two stripes on middle of back and one on rump; sides of head buffy gray, passing into white on lower portion; broken loreal streak and postocular streak black; entire lower surface white or buffy white. Bill deep mouse gray; legs and feet grayish blue.

MEASUREMENTS: *Adult male:* Wing, 214.1–231.9 (average, 222.2) mm.; tail, 67.1–75.9 (72.7); bill (exposed culmen), 59.9–70.1 (65.3); tarsus, 98.1–119.1 (108.7); middle toe without claw, 35.1–41.9 (38.9). *Adult female:* Wing, 202.4–217.9 (211.8); tail, 65.5–71.7 (69.3); bill, 59.9–67.1 (63.8); tarsus, 95.5–109.0 (103.9); middle toe, 36.6–39.9 (38.4).

TEXAS: *Breeding:* Collected along coast northeast to Harris and Galveston, southwest to Cameron cos.; locally inland: Midland, Travis, and Starr cos. *Migration:* Collected north to Dallas (ca. 1915), east to Harris, south to Cameron, west to Maverick, Pecos, and Ward cos. *Winter:* Taken in Cameron Co. (4 specimens). One early winter specimen inland: Travis Co., Austin (Dec. 4, 1921, G. F. Simmons).

NESTING: *Nest:* Sometimes in small colonies; on dry or wet ground, sometimes in water, on flats and about shores of lakes and ponds, on flooded meadows, or mud islands; structure on ground, and when surrounded by water is sometimes 7 in. high, or, if in water, floating platform of sticks, grass, and water plants; lined with grass, shells, bits of dry twigs, fish bones, snail shells, weed stems, and grass. *Eggs:* 3–7, usually 4; ovate to subpyriform; dark clay color, greenish drab, pale brownish olive, or cream buff; with numerous dark brown or black spots, and shell markings of gray and lavender; average size, 43.9 × 30.5 mm.

Phalaropes: Phalaropodidae

RED PHALAROPE, *Phalaropus fulicaria* (Linnaeus)

SPECIES ACCOUNT

Phalaropus fulicarius of A.O.U. check-list, 1957 (see Appendix A). Also known as Gray Phalarope. A chunky phalarope with comparatively short, stout, black-tipped yellow bill and white wing-stripe. *Nuptial*: black (blackish in male) pileum; white cheek-patch; buff-striped blackish back; rich chestnut (paler in male) below; yellow legs. *Winter*: mostly white head with blackish postocular stripe; uniform bluish gray above; white below; broad, black median stripe down white rump; blackish tail. Length, 8¾ in.; wingspan, 16½; weight, 2¼ oz.

RANGE: Circumpolar on coasts and tundra chiefly within Arctic Circle. Migrates at sea and along coasts; casual inland. Largely pelagic in winter, ranging widely through Southern Hemisphere.

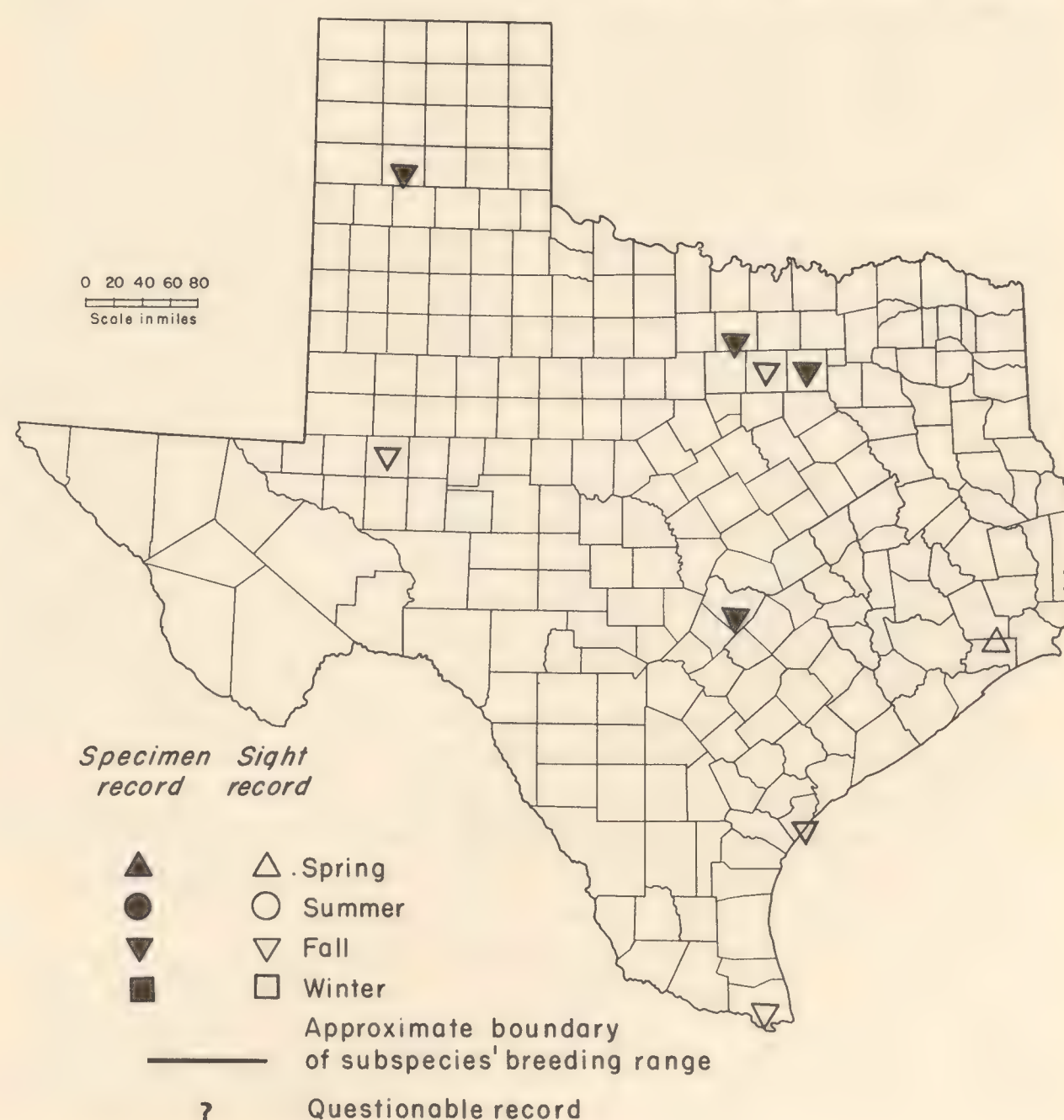
TEXAS: (See map.) *Migration*: Sept. 12 to Nov. 7; Apr. 1. Casual in fall through interior and along coast; accidental in spring. Collected inland in Randall, Wise, Dallas, and Travis cos. (see detailed account). Seven careful sightings: Tarrant Co., minnow farm below Eagle Mt. Dam (2 on Nov. 7, 1949, R. Bowman); Travis Co., Austin sewage ponds (several, Sept. 12, 1961, G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett; female, Sept. 25–27, 1965, Mary Anne McClendon, R. A. Rowlett, J. D. Scurlock, J. W. White); Chambers Co., Cove (Apr. 1, 1935, A. K. McKay); Aransas Co., Rockport (Oct. 5–6, 1952, Connie Hagar); Cameron Co., w. shore of Laguna Atascosa (Oct. 9, 1952, L. C. Goldman); Midland Co., Midland (Nov. 21–24, 1970, Harold Williams, et al.).

HAUNTS AND HABITS: The Red Phalarope is a member of the three-species, role-reversed Phalaropodidae, whose females wear the rich nuptial plumage, typically arrive first on the breeding ground, initiate courtship, and leave incubation and brooding chores to the smaller, drabber males. The present species is the most pelagic of the family. It breeds on islands and coasts of the Arctic Ocean; here on a high spot in low marshy tundra, the male builds the nest—a depression lined with pieces of vegetation. In migration, this bird's reputation as a deep-sea pelagic seems not fully realized; at least in California, masses of Red and Northern

phalaropes sometimes occur near and actually on beaches with or without onshore gales. However, during winter, Reds—often in considerable flocks—drift far out to sea in the Southern Hemisphere. In Texas, as in other interior situations, wandering birds appear casually on streams, lakes, and ponds of plains or prairies.

Phalarope flight is swift, light, and very much like that of a sandpiper; on the wing, the Red is said to be the fastest of its family. The birds fly near the water or spiral in flocks to great heights in the air. When alighting, they touch down like feathers. This and other phalaropes are the only sandpiperlike birds which habitually swim; the lobed toes well equip the birds for rapid, agile movement on either still or wavy water surfaces. The distinctive aquatic feeding method of the phalaropes is to spin in a circle and, while revolving, to stab the bill into the water to pick up tiny organisms which are stirred up. In shallow water, the birds tip up ducklike and feed off the bottom. At sea, Reds usually

RED PHALAROPE, *Phalaropus fulicaria*



congregate about or rest on floating masses of seaweed; they also follow schools of mackerel, other large fish, or whales, which apparently aid them in locating brit, a small reddish copepod that is the phalarope's favored sea food. During the brief period on the breeding grounds—a month or so—phalaropes feed chiefly at shoreline, where they run about rapidly and daintily in search of gnats, their larvae, and other insects.

Red Phalarope vocalizations—notes twittered in series—are described as wheezy, or grating, or thin and high pitched; a few have been rendered as *clink*, *zip*, *tweet*, *whit*, and *prrit*. The very few individuals which have appeared in Texas have vocalized very little.

DETAILED ACCOUNT: ONE SUBSPECIES

COMMON RED PHALAROPE, *Phalaropus fulicaria fulicaria* (Linnaeus)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult female, nuptial plumage:* Acquired by partial prenuptial molt. Pileum, chin, and lores blackish slate; hindneck slate gray or slate color, sometimes mixed with buff or pale ochraceous; back and scapulars dull black, broadly striped, much laterally, with buff, ochraceous, or cinnamon tawny; middle of rump and middle upper tail-coverts anteriorly gray or light neutral gray, lateral feathers of rump white, lateral upper tail-coverts orange cinnamon or cinnamon; tail rather brownish neutral gray, middle feathers chaetura drab; primaries dark mouse gray, shafts white; secondaries deep mouse gray, basal portions and most of inner webs white, innermost secondaries practically all white; wing-coverts deep mouse gray, greater series with broad white tips forming wing-bar; large white triangular area on each side of head includes eyes and reaches back in point to nape; short streak above eye white; entire lower surface, except chin, mikado brown or light russet; lining of wing white, outer feathers hair brown. Bill orange or antimony yellow at base, tip black or brownish black; iris cinnamon brown; legs and feet dull yellow, dark brown, or anteriorly dark medici blue, and on inner side pale mouse gray, joints darker, lobes of toes yellow, tiller buff, or light brown; claws black. *Adult male, nuptial:* Acquired by partial prenuptial molt. Like nuptial adult female, but forehead buffy white or buffy gray; rest of pileum fuscous streaked with buff; sides of head buffy white, more or less mottled slightly and streaked with fuscous; nape and back much mixed and streaked with pale buff; chin pale dull brown mixed with white; remainder of lower surface paler than in female. Bill black, but base ocher yellow; inside of mouth and tongue white; bare space on chin clove brown; iris vandyke brown or prout brown; legs and feet externally olive gray, but inner sides of tarsus and outer toe drab gray or mouse gray, inner sides of other toes and lobes of toes buff; claws black. *Adult male and female, winter:* Acquired by complete postnuptial molt. Top of head white; occiput chaetura drab; remainder of upper surface rather bluish neutral gray, some feathers with obscure white tips; orbital region mostly chaetura black, with postocular stripe of white; entire lower surface white. Bill dull black, yellow at base; feet bluish gray. *Male and female, second winter:* Acquired by complete postnuptial molt. Like adults in winter. *Male, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but differs in retention of some juvenal wing-coverts. *Female, first nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult female but still retaining some juvenal wing-coverts; crown and white on sides of head more or less suffused with buff or pale rufous. *Male and female, first winter:* Acquired by partial postjuvenal molt. Similar to adults in winter, but tail and wing-coverts like those of juvenal. Bill slate black, but base tawny olive; legs and feet drab; webs of toes maize yellow; claws black. *Juvenal:* Acquired by complete postnatal molt. Much of

upper parts dull black, feathers edged and tipped with ochraceous tawny, mars yellow, or raw sienna; upper wing-coverts, rump, and upper tail-coverts slate gray, upper tail-coverts edged with ochraceous or tawny, middle wing-coverts edged with pale buff; sides of head and neck, with lower surface, white, throat and jugulum suffused with brownish buff. Bill black, without yellow, but base of mandible olive.

MEASUREMENTS: *Adult female:* Wing, 129.5–138.9 (average, 135.4) mm.; tail, 63.0–71.1 (66.3); bill (exposed culmen), 21.1–23.9 (22.6); tarsus, 20.1–22.6 (21.1); middle toe without claw, 19.0–21.6 (20.3). *Adult male:* Wing, 119.6–130.0 (125.2); tail, 58.9–70.6 (62.7); bill, 18.5–23.1 (21.9); tarsus, 19.6–21.6 (20.9); middle toe, 19.6–21.6 (20.6).

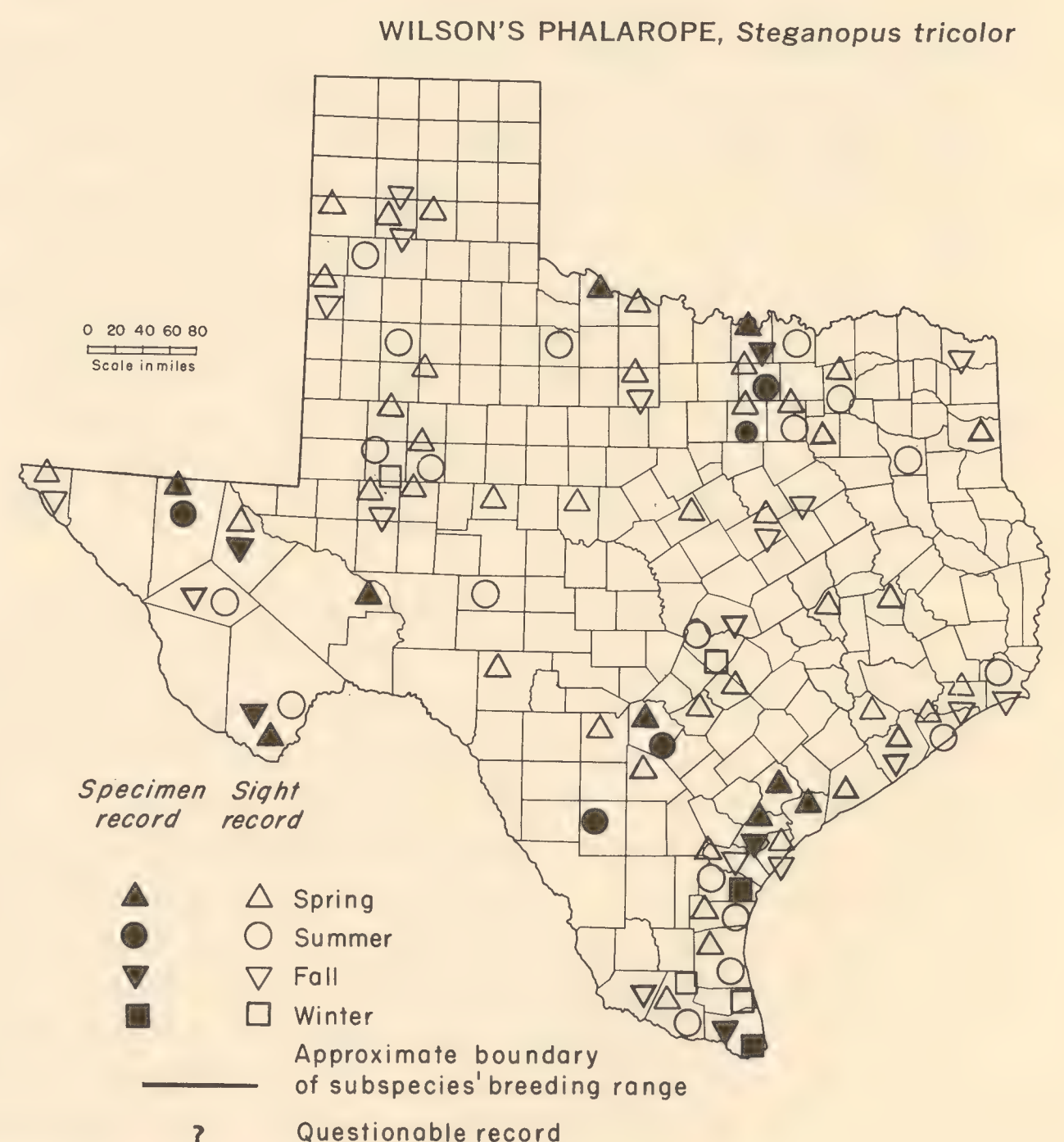
RANGE: Locally in Arctic (excluding e. Greenland, Iceland, and Spitzbergen); in North America, on coasts and coastal islands from n. Alaska to n.w. Greenland, south to w. Alaska and s.w. Greenland. Nonbreeders summer off coast of Newfoundland. Migrates along both coasts of North America, occurring casually inland. Winters at sea mainly in Southern Hemisphere; in South America, on both coasts to Patagonia.

TEXAS: *Migration:* Four inland collections: Randall Co., near Canyon (Oct. 12, 1933, J. O. Stevenson); Wise Co., near Decatur (Sept. 26, 1893, J. A. Donald); Dallas Co., Mt. Creek Lake (female, Sept. 8, 1972, W. M. Pulich; skin at University of Dallas); Travis Co., Hornsby Bend sewage ponds (female, nonbreeding plumage, captured and measured, Sept. 15, 1963, G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett; photographed, Sept. 16, Mary Anne McClendon, et al., and released; bird recaptured when found emaciated, but it died, Sept. 18, Betty Plass, F. S. Webster, Jr.; identification confirmed by E. B. Kincaid, Jr., et al.).

WILSON'S PHALAROPE, *Steganopus tricolor* Vieillot

SPECIES ACCOUNT

A trim phalarope with long, black needlelike bill; long, slender neck; long, black (yellowish in fall) legs. Has all-dark wings, solid white rump, and grayish tail.



Nuptial female: mostly gray above and white below, with bold black face- and neck-stripe, becoming cinnamon at lower neck and extending onto back. *Nuptial male*: much duller, with cinnamon wash on neck and dull white nape-spot. *Winter*: pale gray above, pure white below, with grayish postocular stripe or patch. Length, 9¼ in.; wingspan, 16½; weight, 1½ oz.

RANGE: Locally from interior British Columbia across c. Prairie Provinces to s.w. Great Lakes region (sparingly), south to interior c. California, Utah, Colorado, and Nebraska. Winters inland mainly in s. South America; casually as far north as s. coastal Texas.

TEXAS: (See map.) *Migration*: Mid-Apr. to late May; late July to late Oct. (extremes: Mar. 15, June 25; July 15, Jan. 1). Very common to uncommon in spring through most parts, but scarce in extreme southwestern portion and in interior eastern quarter. Common to scarce in fall through most regions, but rare in extreme southwest. *Winter*: Jan. 6 to Feb. 19. Casual in south Texas, where recorded in Nueces (see detailed account), Cameron (see detailed account), and Hidalgo (2 near San Manuel, Jan. 27, 1969, Rev. and Mrs. R. C. Smith) cos.

HAUNTS AND HABITS: The Wilson's, longest of the Phalaropodidae, differs from the Red and Northern phalaropes in range—it is strictly a bird of the Americas; in haunts—it breeds inland, migrates largely overland, and in winter seldom goes near the sea; and in habits—it feeds at shoreline and in wet meadows more than it spins like a top on water. On prairie meadows of southwestern Canada and northwestern United States, males, in orthodox phalarope manner, incubate the clutch—four dark-brown-spotted buff eggs which females have laid in a grass-lined depression in damp ground. In Texas, the species is the only numerous member of its family. Migrating individuals, preferring fresh to salt water, are found along inland bodies of water, rarely along Gulf beaches and bays; on the lower coastal plains a very few linger into winter. *S. tricolor* tends to be gregarious at all times of the year.

On the wing, the Wilson's is light, airy, and graceful, and resembles a Lesser Yellowlegs or Stilt Sandpiper in flight. It is a buoyant swimmer and, while it does feed phalarope style by whirling in the water, this is not its preference. In search of insects—mosquito larvae, aquatic bugs, beetles, water flea eggs—the Wilson's runs about energetically in wet meadows or along stream and pool margins. It also wades, often breast-high, in shallow water where it picks bugs off the surface; or, with its needlelike bill, it probes and sweeps the muddy bottom, sometimes with head completely submerged. Its shore and wading habits undoubtedly explain a longer bill, neck, and legs than those of either the Red or Northern; and since it swims less, the Wilson's toes are less lobed.

On and near the breeding grounds, Wilson's Phalaropes sound low nasal *wurk*'s and similar toadlike grunts and croaks. Migrants vocalize a good bit in spring.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult female, nuptial plumage*: Acquired by partial prenuptial molt. Crown light bluish gray; forehead similar, somewhat paler; middle of hindneck dull white; middle of back and scapulars slate gray; rump hair brown; upper tail-coverts white, tail mouse gray, outer feathers mostly white on inner webs except at tip, with some mottlings of mouse gray; primaries fuscous or fuscous black, shafts paler, that of outermost nearly pure white; secondaries hair brown, very narrowly tipped with grayish white; tertials mostly olive brown; wing-coverts between hair brown and fuscous, very inconspicuously edged with paler brown; supraloral streak white; loral stripe black; long, broad, postocular streak black, extending down sides of upper neck; stripe down sides of lower hindneck and on scapulars chestnut; lower parts white, sides of neck below black streak, with sides of throat, hazel, middle of throat and jugulum washed with same color; lining of wing white, slightly mottled on outer edge with hair brown or drab. Bill black; iris dark brown; legs and feet black; lower eyelid white. *Adult male, nuptial*: Acquired by partial prenuptial molt. Like nuptial adult female but much duller in color; pileum fuscous, back and scapulars lacking most of chestnut, this when present very much duller and more ochraceous. Bill, gape, and tongue black; iris vandyke brown; legs and feet black. *Adult male and female, winter*: Acquired by complete postnuptial molt. Upper parts brownish gray, paler on hindneck, forehead dull white, with obscure darker shaft streaks on feathers, and inconspicuous whitish tips; upper sides of neck like nape; entire lower surface white. Bill black; iris dark brown; feet light yellow. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male but sometimes distinguishable by retention of some wing-coverts and scapulars from first winter. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female, except for retention sometimes of part of wing-coverts and scapulars from first winter. *Male and female, first winter*: Acquired by partial postjuvenile molt. Like adults in winter, except for wings, which are retained from juvenile but are lighter in color, due to fading. *Juvenal*: Acquired by complete postnatal molt. Like nuptial adult male, but feathers of back, scapulars, and tertials conspicuously margined with cinnamon or ochraceous tawny, extending to some inner lesser wing-coverts; jugulum, throat, and sides of neck slightly washed with pale buff. Bill flesh color, but base of mandible dull yellow, or maxilla seal brown and mandible drab changing to ecru drab at base and to cream color at tip; iris seal brown, vandyke brown, or light brown; legs and feet buff yellow, flesh color, or drab anteriorly; tarsus and part of tibia posteriorly smoke gray mottled with dull black; lobes and toes edged with cream color; claws drab or black.

MEASUREMENTS: *Adult female*: Wing, 130.0–137.4 (average, 132.8) mm.; tail, 52.6–65.0 (55.6); bill (exposed culmen), 31.0–36.1 (33.0); tarsus, 30.5–33.0 (31.8); middle toe without claw, 24.4–26.4 (25.1). *Adult male*: Wing, 116.1–125.0 (121.2); tail, 48.0–54.1 (51.3); bill, 27.9–31.0 (30.5); tarsus, 28.4–33.0 (30.2); middle toe, 22.1–24.9 (23.9).

TEXAS: *Migration*: Collected north to Wilbarger, east to Cooke, south to Calhoun and Cameron, west to Brewster and Culberson cos. *Winter*: Five specimens: Nueces Co., Corpus Christi (3 on Jan. 19, 1890, G. B. Sennett collection; Feb. 19, 1904, F. B. Armstrong); Cameron Co., Brownsville (Jan. 6, 1894, F. B. Armstrong).

NORTHERN PHALAROPE, *Lobipes lobatus* (Linnaeus)

SPECIES ACCOUNT

Also known as Red-necked Phalarope. A small phalarope with rather long, black needlelike bill and white

wing-stripe. *Nuptial female*: dark gray above with longitudinal buffy back-stripes; white throat; rufous patch on side of neck (sometimes rufous meets in collar below throat); mainly white below. *Nuptial male*: duller and browner, with solid brownish nape. *Winter*: mostly dark gray or blackish above with whitish back-stripes; white below; blackish postocular stripe; broad blackish median stripe down white rump and tail. Length, $7\frac{3}{4}$ in.; wingspan, $13\frac{3}{4}$; weight, $1\frac{1}{2}$ oz.

RANGE: Circumboreal on coasts and tundra primarily in subarctic regions; in North America, from Arctic coast and s. Greenland to s. Alaska, Great Slave Lake, James Bay, and Labrador. In Western Hemisphere migrates at sea (chiefly) and inland (regularly through w. North America). Largely pelagic in winter, ranging widely through Southern Hemisphere; north sparingly along e. Pacific coast to s. California.

TEXAS: (See map.) *Migration*: Late Apr. to late May; mid-Aug. to mid-Oct. (extremes: Apr. 4, June 6; July 12, Dec. 22). Scarce but regular in fall through most of interior (largely absent from southwestern region); rare along central and lower coasts; casual on upper coast. Rare in spring through interior; casual on central coast.

HAUNTS AND HABITS: The smallest of its family, the Northern Phalarope is also the most abundant and widely distributed. It nests in loose colonies on wet, pond-dotted meadows of marshes by lakes or streams. Both sexes prepare the nest—a small but deep depression hollowed in a damp mound or tussock. Characteristic of the reversed roles of phalaropes, the male does all the sitting on the eggs; he alone has the incubation patches—two of them. He probably tends the young by himself as well. The female occupies breeding territory, courts male, selects nest site, and alerts male

when intruders approach. The Northern winters in southern oceans; to get there it usually migrates well offshore. However, it is slightly less pelagic than the Red Phalarope and some appear, especially in fall, on inland lakes and ponds of the United States, chiefly in the Great Basin area. In the Panhandle of Texas, small groups of Northerns migrate more or less regularly with flocks of Wilson's; in other parts of the state, single individuals occasionally occur. The species is gregarious both on the nesting grounds and in winter feeding flocks at sea, where it commonly associates with the Red.

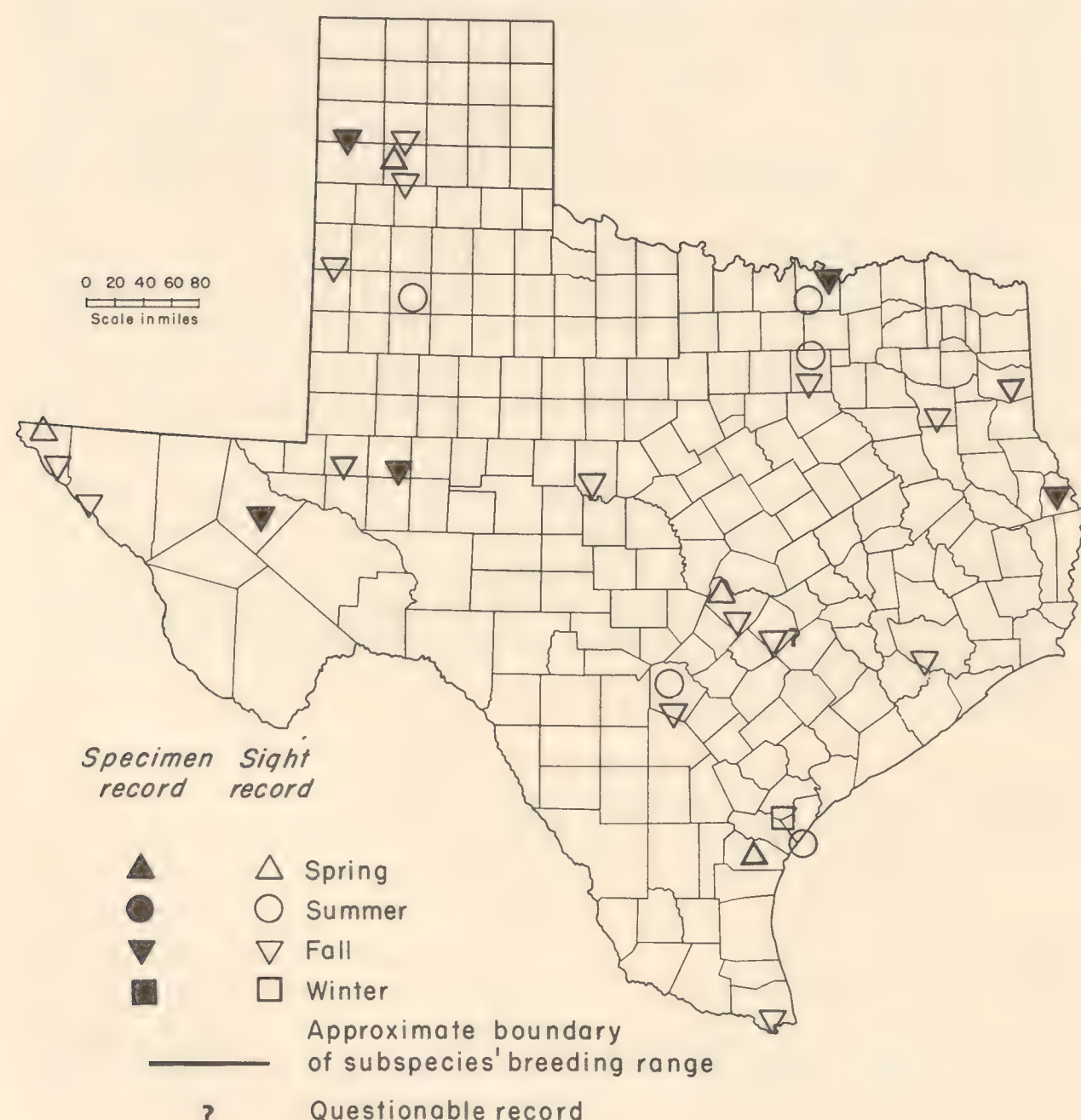
Flight of the Northern, typical of its family, is swift, often erratic, and much like that of a sandpiper. In water, this bird—bobbing like a cork—is a dainty and buoyant swimmer; it holds its head erect and nods it forward with each paddle of its feet. In offshore tide rips and on and about flotsam and seaweed, it spins like a whirligig, stabbing its bill into the water to pick up minute marine organisms. It virtually never dives, because the buoyancy of its thick breast feathers prevents it from getting very far underwater. Inland, the bird feeds by spinning in freshwater situations, consuming mosquito larvae, water bugs, and beetles. On saline or alkaline watercourses it takes brine shrimp and alkali flies.

Vocalizations of the Northern Phalarope, like those of the Red, are rather nondescript twitterings variously described as *kit*, *whit*, *quet*, *tchip*, *tcchep*, *pe-et*, and *pleep*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult female, nuptial plumage*: Acquired by partial prenuptial molt. Upper surface dull dark slate gray or blackish slate, including sides of head, the back and scapulars with a stripe of buff or ochraceous on each side, and middle upper tail-coverts brownish slate, lateral feathers barred with white or pale buff; tail dull hair brown, middle feathers inclining to fuscous, outer feathers white at base of inner webs; primaries fuscous, shafts mostly white; secondaries dull hair brown, base of inner webs white, increasing in extent on inner feathers, and inner secondaries narrowly edged on terminal portion with white; tertials fuscous, edges slightly paler; wing-coverts chaetura drab with slightly paler edgings and greater series with broad tips of white; sides of neck cinnamon rufous, this sometimes meeting across throat, which is centrally brownish neutral gray together with jugulum and sides of jugulum; remainder of lower parts white, sides mottled with hair brown, sometimes mostly hair brown, lower tail-coverts with small streaks or spots of same color; lining of wing white mixed with hair brown, posteriorly mostly light hair brown or drab. Bill black; inside of mouth and tongue slate black; iris dark vandyke brown, eyelids white; inner side of legs and feet plumbeous, outer side blackish slate; webs between inner toes grayish white, outer webs blackish slate. *Adult male, nuptial*: Acquired by partial prenuptial molt. Like adult female but smaller and colors of plumage duller; upper parts fuscous, feathers margined, particularly posteriorly, with ochraceous or dull buff, and wings more brownish; throat and jugulum hair brown, with white edgings. Bill black; iris vandyke brown; legs and feet dark grayish blue, blackish slate, or dull brown; claws black. *Adult male and female, winter*: Acquired by complete postnuptial molt. Head and nape white or dull white, occiput more or less slate gray; short stripe on side of head from eye

NORTHERN PHALAROPE, *Lobipes lobatus*



to auriculars black, middle of hindneck and mantle brownish neutral gray, feathers with white edgings and tips; wings with conspicuous white tips on upper coverts; sides of head and entire lower parts white. Bill, legs, and feet black. *Male, first nuptial*: Acquired by partial prenuptial molt. Nearly same as nuptial adult male and differs, if at all, in retention of some wing-coverts and scapulars from first winter. *Female, first nuptial*: Acquired by partial prenuptial molt. Nearly same as nuptial adult female, differing, if at all, in retention of some wing-coverts and scapulars from first winter. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, except for retention of wings of juvenile. *Juvenile*: Acquired by complete postnatal molt. Forehead dull white; remainder of upper surface chaetura black or dull black, crown sometimes streaked with buff or ochraceous, back, scapulars, and tertials with conspicuous streaks of buff, ochraceous, and mars yellow; sides of head and jugulum more or less deeply tinged with avellaneous or dull vinaceous buff; sides and flanks somewhat washed with same and with a few obscure darker

streaks; otherwise like adults in winter. Bill brownish black; iris brownish black; legs and feet bluish flesh color.

MEASUREMENTS: *Adult female*: Wing, 104.9–116.1 (average, 110.2) mm.; tail, 48.5–52.6 (50.3); bill (exposed culmen), 20.1–23.9 (22.4); tarsus, 18.5–21.1 (19.8); middle toe without claw, 18.0–20.1 (19.3). *Adult male*: Wing, 102.1–109.0 (105.1); tail, 46.0–50.0 (48.3); bill, 21.1–23.1 (22.1); tarsus, 18.0–20.1 (19.3); middle toe, 18.0–20.6 (19.6).

TEXAS: *Migration*: At least six collections: Oldham Co., 5 mi. northwest of Boise (Sept. 5, 1920, A. J. Kirn; skin not preserved); Grayson Co. (Oct. 3, 1953, fide J. S. Weske; University of Oklahoma Museum of Zoology collection, no. 829); Midland Co., 40 mi. southeast of Midland (male, Sept. 9, 1962, J. C. Henderson; Texas A&M University collection, no. 6750); Reeves Co., Balmorhea Lake (Oct. 21, 1969, J. F. Scudday, and Nov. 1, 1971, Guidry and Scudday; both skins in Sul Ross State University collection, nos. 383, 621); Sabine Co., Toledo Bend Reservoir (Sept. 10, 1972, C. D. Fisher; Stephen F. Austin State University collection).

Thick-knees: Burhinidae

DOUBLE-STRIPED THICK-KNEE, *Burhinus bistriatus* (Wagler)

SPECIES ACCOUNT

American Thick-knee and Mexican Stone Curlew of various authors. A crow-sized, ploverlike bird with large, round head; short, thick blackish bill; very large yellow eyes; long, sturdy greenish legs enlarged at the knee (tibiotarsal) joint. Mostly buff-streaked dark brown above with white orbital area and eye-stripe bordered above by blackish lateral crown-stripe; buffy face, neck, and breast finely streaked with dusky; white throat, belly; black-tipped tail with subterminal white band; in flight, shows some white at base of primaries. Length, 20 in.; wing (folded), 10½.

RANGE: S. Mexico to Costa Rica, and in n. South America (including Isla Margarita); also Hispaniola. Accidental in s. coastal Texas.

TEXAS: *Accidental*: One specimen: Kleberg Co., near the shore of Laguna Madre, east of Laguna Larga on the Laureles Ranch—a division of the King Ranch, 15 mi. southeast of Chapman Ranch community (female, Dec. 6, 1961, E. B. Chamberlain, C. D. MacInnis; U.S. Nat. Museum collection, no. 478866).

HAUNTS AND HABITS: The thick-knees, often called stone curlews, are strange birds of curious distribution. There are nine species in the family (Van Tyne and Berger). In the Old World they are widespread in temperate and tropical regions, but in the Americas they are strictly tropical, except for one fantastic occurrence of a Double-striped Thick-knee on the warm temperate, grassy coastal plain of southern Texas. Upon this first collection of the species on United States soil, ornithological chauvinists rejoiced; here was a new family, genus, and species for the North American list—just as if Mexico and Central America were not solid portions of the North American continent! Normal habitat for *Burhinus bistriatus* is torrid, semiarid, short-grass (verging on bare ground) savannah, as at La Piedra on the Alvarado Peninsula, south of Veracruz City, Mexico; this locality, well south of the Tropic of Cancer, is ordinarily the closest approach to the United States that this species makes. From the Alvarado plains southward, the female deposits two

brown- and lilac-spotted buff eggs in a slight depression in the ground.

For a ground-dwelling bird whose legs are so well developed, the present species flies well; it flushes heavily and without much wing sound, but after it launches itself into the air, its flight speed is impressive. The Doublestripe, however, spends much of its life walking about on turf, soil, and sand in search of cockroaches (pet birds feed heavily on these), crickets, grasshoppers, worms, mice, and other nighttime crawlers and jumpers. As the startlingly large eyes indicate, the thick-knee carries on practically all its activities in dim light—dusk, dawn, and moonlit nights. Daytime it spends resembling an anthill or a heap of dry cow manure. Like many other long-legged birds, including cassowaries, it dozes while resting on its thickened knees with tarsi and feet bent forward.

On calm, clear nights of full moon, Double-striped Thick-knees, often in flocks even during the breeding season, voice a peculiar barking or yapping note throughout the night. Sunrise usually reveals a silent loose flock of *Burhinus bistriatus* in the exact place from whence so much clamor issued during the just concluded dusky hours.

DETAILED ACCOUNT: ONE SUBSPECIES

MEXICAN DOUBLE-STRIPED THICK-KNEE, *Burhinus bistriatus bistriatus* (Wagler)

DESCRIPTION: *Adults, nuptial plumage*: (See also Ridgway, 1919, *Bull. U.S. Nat. Mus.*, no. 50, pt. 8, pp. 20–21.) Middle of pileum fuscous, streaked with buff; sides of crown and anterior neck black; superciliary stripe white; forehead, lores, and malar region buff or dull white; neck dull buff, finely streaked with brown; rest of upper surface fuscous with feather edgings of buff; chin and throat white; lower tail-coverts buff; remaining lower parts white; wings brownish gray, quills partly white basally; tail brownish gray and white. Bill black, basal part of mandible horn color; iris yellow; legs and feet greenish yellow. *Adults, winter*: Similar to nuptial adults. *First winter*: Similar to adults in winter, but more rufescent above. *Juvenal*: Acquired by complete postnatal molt. Like first winter, but upper parts more mottled with rufous or cinnamonaceous feather margins.

MEASUREMENTS: See Ridgway, *ibid.*, p. 22.

RANGE: Resident in Mexican states of Veracruz, Tabasco, Oaxaca, and Chiapas, south to w. Costa Rica. Accidental in Kleberg Co., Texas.

TEXAS: *Accidental*: One specimen (see species account).

Jaegers: Stercorariidae

POMARINE JAEGER, *Coprotheres pomarinus* (Temminck)

SPECIES ACCOUNT

Stercorarius pomarinus of A.O.U. check-list, 1957 (see Appendix A). Also known as Pomatorhine Skua. A heavily built jaeger; has broad tail with elongated (projecting up to 4 in.), twisted, and spoon-ended central feathers (these often worn or broken); narrow pointed wings, showing much white at base of primaries; heavy, hooked, blackish bill; blackish legs. *Adult*: plumages vary (see detailed description), but usually has blackish cap; sooty brown upper parts; yellowish sides of neck; whitish under parts heavily dusky-barred across breast and on sides. *Immature*: similar in build, but central tail feathers obscure or lacking; mostly dark brown, strongly barred and mottled with buff. Length, 21¼ in.; wingspan, 4 ft.; weight, 1¾ lbs.

RANGE: Circumpolar on coasts, islands, and tundra within and near Arctic Circle. Largely offshore and pelagic during nonbreeding season, ranging from latitude of s. United States well into Southern Hemisphere.

TEXAS: (See map.) *Winter* (chiefly): Uncommon to scarce over Gulf waters on continental shelf, 20 to 100 mi. from shore. *Vagrant*: Rare to casual along coast; accidental inland during fall.

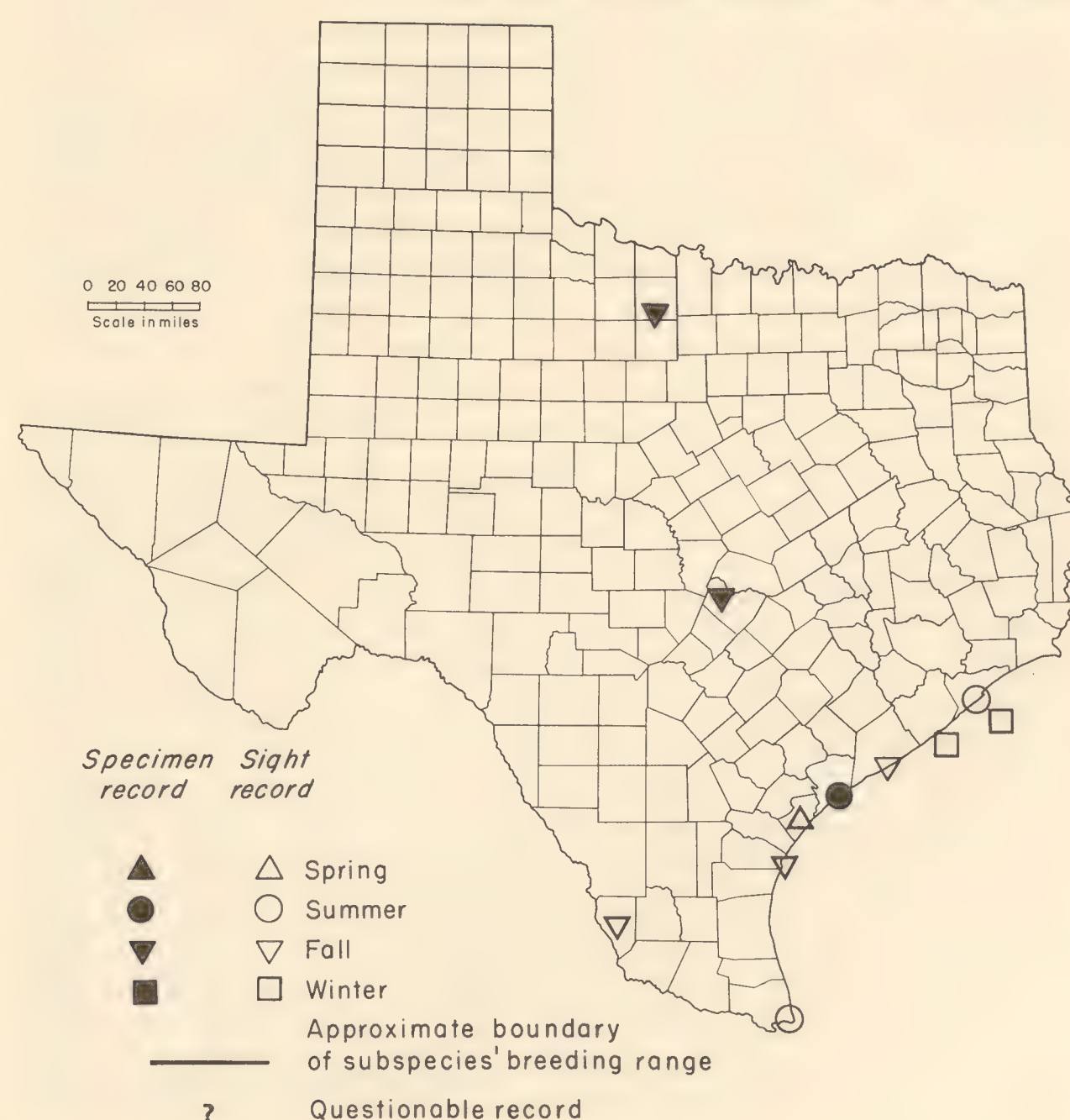
HAUNTS AND HABITS: The Pomarine Jaeger is a hook-billed, gull-like seabird whose flight has the swift dash of a falcon; the present bird is a medium-sized member of its four-species family. In scattered colonies it nests on low marshy tundra—occasionally cliff ledges—where it lays two brown-spotted olive eggs in a grass-lined cup. Jaegers are known to be aggressive nest defenders who will strike even human intruders. In winter, the Pomarine becomes pelagic, following other seabirds to fishing banks of bluefish, mackerel, and other fin-propelled animals; at this season it is seldom seen from land.

Water temperature in the Gulf of Mexico seems to suit the Pomarine, and bird watchers expect it to be the most regular of the Stercorariidae here. In spring of 1962, Dr. and Mrs. C. H. Brownlee obtained motion pictures of 50-plus Pomarine Jaegers which were darting about their freighter at one point in the Gulf over

one hundred miles off Port Aransas, Texas. The Pomarine, like other marine birds, is occasionally forced inland by tropical storms. Thus, when the eye of Hurricane Carla broke up near Austin, Texas, on September 12, 1961, it deposited a hefty Pomarine Jaeger on Lake Travis; this individual promptly died, perhaps from exhaustion or starvation, or from drinking fresh water.

A master of the air, the Pomarine is powerful and swift; wing-beats are steady, direct, and constant. In the vicinity of the nesting grounds, this jaeger preys on small birds, and the eggs and young of most species; it also eats lemmings, mice, and other small mammals as well as offal and carrion. The Pomarine is a pirate about fishing banks. It waits until a smaller gull, tern, or shearwater catches a small fish churned up by a school of larger marine species. The jaeger then zooms in, harassing the bird until it drops or disgorges its catch, whereupon the raider hastily confiscates the food, usually in mid-air. The Pomarine also frequently trails ships in gull fashion where it picks up galley scraps and other refuse thrown overboard. It swims readily on the water surface.

POMARINE JAEGER, *Coprotheres pomarinus*



Vocalizations of the Pomarine Jaeger include a sharp *which-yew*, a squealing *week-week* similar to that of a Herring Gull, and single- or double-noted hawklike whistles. It utters low harsh chattering cries when feeding in companies. Occasionally this bird is heard in Texas.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN POMARINE JAEGER, *Coprotheres pomarinus pomarinus* (Temminck)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage (light phase):* Acquired by partial prenuptial molt. Pileum deep chaetura black, forehead, lores, and malar region somewhat lighter; sides of head and neck, with cervix, white, tips of most of feathers pointed and cream buff to antimony yellow; nape and remainder of upper surface deep chaetura drab, nape somewhat spotted or streaked with white, sometimes very slightly; wings and tail fuscous black or hair brown, passing into fuscous on inner webs, bases of outer primaries on inner webs white, shafts of outer primaries ivory yellow, passing into fuscous on inner primaries, shafts of tail feathers ivory yellow at base, passing into fuscous or fuscous black at tips of feathers; chin white, throat white with yellow pointed feathers like sides of neck; jugulum usually with collar of chaetura black or chaetura drab spots or bars, this sometimes entirely absent; crissum deep hair brown to light chaetura drab; remainder of lower surface white, sides more or less spotted with chaetura black or chaetura drab; lining of wing hair brown or chaetura drab. Bill grayish or brownish black terminally, but warm sepia, cinnamon buff, or mikado brown basally, mandible drab, vinaceous buff, or army brown at base, sometimes bill yellowish brown or brownish white, terminal third black; lining of mouth dull yellowish flesh color; gape light vinaceous fawn to plumbago blue; eyelids dull gray; iris mars brown or blackish brown; legs and feet plumbeous, slate black, or dull black, sometimes with dull blotches of dull blue-gray or lilac gray on lower part of front of tarsus; hind toe flesh color; claws black or flesh color. *Adults, nuptial (dark phase):* Pileum fuscous black to chaetura black; remainder of upper parts dark hair brown to dark chaetura drab; wing-quills fuscous to hair brown on inner webs, shafts of outer primaries ivory yellow, of inner primaries fuscous or fuscous black, bases of inner webs of primaries white or brownish white, as are extreme bases of secondaries; sides of neck olive brown to buffy brown, or chamois to tawny olive, though sometimes dull black; lower surface paler light hair brown to dark hair brown, rather darker anteriorly, including lining of wing, feathers with sometimes pale dull buff and white edgings; shafts of middle tail feathers at base ivory yellow, shading to fuscous at tips; shafts of remaining tail feathers variously yellow or light hair brown. *Adults, winter (light phase):* Acquired by complete postnuptial molt. Similar to light phase of nuptial adults, but feathers of pileum and mantle with some whitish or buff tips; some feathers of crissum with white areas or bars. *Adults, winter (dark phase):* Similar to dark phase of nuptial adults. *Third nuptial (light phase):* Acquired by partial prenuptial molt. Similar to light phase of nuptial adults, but middle tail feathers somewhat shorter, little, if any, twisted; yellow of back and sides of neck paler; chin, jugulum, breast, and sides more spotted; under wing-coverts and axillars with some white edgings, and often some bars of white, anterior lesser wing-coverts often edged with white; upper and lower tail-coverts and anal region usually more marked with white; chin and throat sometimes heavily streaked with chaetura black or chaetura drab. *Third nuptial (dark phase):* Similar to nuptial adults, dark phase, but middle tail feathers shorter; upper parts somewhat more brownish and usually rather paler; under surface, particularly posteriorly, under wing-coverts, and sometimes upper tail-coverts, narrowly tipped or subterminally barred with dull buff; sides and back

of neck sometimes with yellow feathers. *Third winter (light phase):* Acquired by complete postnuptial molt. Similar to third nuptial, light phase, including length of tail, but pileum lighter, and a little more brownish; neck with few or no yellow feathers; feathers of hindneck with some dull buff tips; upper wing-coverts and axillars almost uniform; throat and breast more heavily barred with blackish brown; remainder of lower surface with many more dark markings; flanks, crissum, and upper tail-coverts more heavily barred. *Third winter (dark phase):* Similar to third nuptial, dark phase. *Second nuptial (light phase):* Acquired by partial prenuptial molt. Resembling third winter, light phase, but neck and throat with much more yellow; hindneck and upper back conspicuously barred and spotted with white or pale buffy white; lower parts with relatively little dark color, median portions, except jugulum, mostly white, and dark markings on jugulum often very much reduced; under wing-coverts and axillars, under tail-coverts, as well as upper tail-coverts, broadly barred with white, but lower tail-coverts sometimes almost all white; anal region white, barred or mottled with hair brown. *Second nuptial (dark phase):* Similar to third winter, dark phase, but tail rather shorter; lower parts and sometimes under wing-coverts conspicuously tipped with pale buff or dull cream white; no yellow feathers on neck. *Second winter (light phase):* Acquired by complete postnuptial molt. Similar to second nuptial, light phase, but middle tail feathers barely longer than rest; pileum paler, finely spotted and mottled with dull buff, dull white, and drab, hindneck somewhat washed with drab, and hindneck, with back and scapulars, more tipped and barred with white or pale drab; tertials tipped with same; neck and throat with little or no yellow; throat and chin with much more dark marking; upper tail-coverts, lower tail-coverts, and under wing-coverts all strongly barred with white, though some specimens have lining of wing almost plain hair brown or chaetura drab. *Second winter (dark phase):* Similar to second nuptial, dark phase. *First nuptial (light phase):* Acquired by complete postjuvenile molt. Similar to second winter, light phase, with middle tail feathers scarcely elongated; upper and lower parts more brownish and buffy, ground color of upper parts fuscous, pileum and hindneck darker, bars and spots on upper surface darker, dull buff, dull cinnamon, or fawn color, those on upper tail-coverts dull pinkish cinnamon, and with relatively few spots or bars on hindneck; wings and tail on exposed surface fuscous black; dark markings on lower surface very much more extensive; lighter bars and spots on anterior lower surface dark drab, drab, pinkish cinnamon, and pinkish buff. *First nuptial (dark phase):* Middle tail feathers very short, only a little longer than others; upper parts fuscous, head not conspicuously darker; lower parts hair brown, paler on throat and breast, darkest on jugulum; lower wing-coverts, axillars, upper and lower tail-coverts narrowly tipped with buff, and lower tail-coverts, including most of other lower parts, sometimes inconspicuously barred. *First winter (light phase):* Acquired by wear from juvenal. Similar to light phase of juvenal. *First winter (dark phase):* Acquired by wear from juvenal. Similar to dark phase of juvenal. *Juvenal (light phase):* Acquired by complete postnatal molt. Middle tail feathers short; barely elongated as in second nuptial, general color paler, more brownish; pileum hair brown, feathers edged with dull avellaneous; hindneck rather buffy avellaneous, barred and spotted with drab, dark drab, light hair brown, and hair brown; remainder of upper parts light fuscous; wings fuscous or rather dark fuscous, outer primaries with white or brownish white bases on inner webs, and upper surface and inner wing-coverts broadly margined or tipped with pinkish buff, cinnamon, or buffy white; upper tail-coverts broadly barred with same; throat and sides of neck buffy avellaneous, obscurely barred with drab and light drab; remainder of lower parts buff, pale pinkish buff, or light pinkish cinnamon, barred with hair brown, drab, and light drab; crissum buff or buffy white, heavily barred with hair brown and dark hair brown; under wing-coverts hair brown or light fuscous, barred with white or buffy white. Bill yellowish brown, brownish black at tip; iris dull brownish white; legs and feet dull plumbeous, with webs and outer half of toes black. *Juvenal*

(*dark phase*): Acquired by complete postnatal molt. Similar to juvenal, light phase, but pale tips of head, neck, and throat are either absent or very inconspicuous; light tips of upper surface are few and narrow; lower surface, except lining of wing and tail-coverts, less conspicuously barred.

MEASUREMENTS: *Adult male*: Wing, 329.9–359.9 (average, 346.5) mm.; tail, 186.2–245.1 (210.3); bill (exposed culmen), 35.1–40.9 (38.6); height of bill at base, 14.0–16.0 (15.2); tarsus, 50.0–57.9 (54.3); middle toe without claw, 39.9–45.0 (42.9). *Adult female*: Wing, 340.1–364.0 (347.7); tail, 172.0–230.4 (189.2); bill, 37.1–41.9 (39.1); height of bill, 14.5–17.0 (15.5); tarsus, 51.6–58.9 (54.1); middle toe, 39.9–46.5 (43.7).

RANGE: Locally in arctic regions of e. North America, Europe, and w. Asia; in North America, from Southampton Island and Baffin Island to w. Greenland. Winters chiefly at sea in North Atlantic and e. Pacific; in Western Hemisphere, off coasts from Virginia through West Indies to w. Colombia and w. Peru. Recorded casually inland throughout North America.

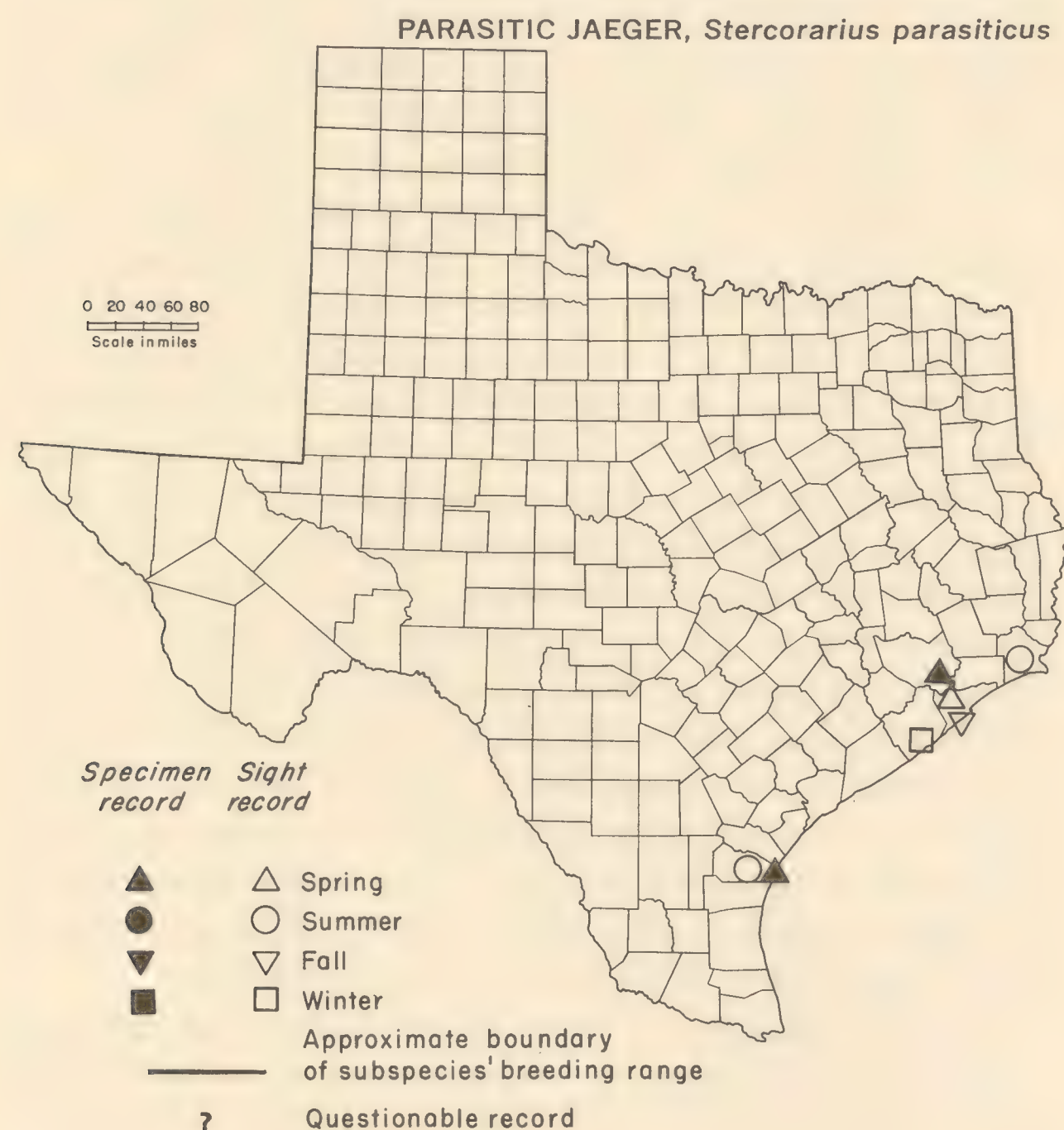
TEXAS: *Vagrant*: Three specimens: Archer Co., Lake Kickapoo (Oct. 8, 1957, M. Stallcup; Midwestern University collection); Travis Co., Lake Travis near Volente (light phase subadult, found following Hurricane Carla, Sept. 13, 1961, E. B. Kincaid, Jr., skin designated for Texas A&M University collection); Calhoun Co., s.w. Matagorda Island (June 13, 1937, A. R. Hines).

PARASITIC JAEGER, *Stercorarius parasiticus* (Linnaeus)

SPECIES ACCOUNT

Also known as Arctic Skua. *Adult*: resembles larger, heavier Pomarine, but with narrow, sharply pointed, elongated (projecting up to 4 in.) central tail feathers; markedly sligher bill; less heavily barred on breast and sides; less white at base of primaries. *Immature*: closely resembles young Pomarine (often indistinguishable in field), but bill noticeably sligher. Length, 19¼ in.; wingspan, 3½ ft.; weight, 1 lb.

RANGE: Circumboreal on arctic and subarctic coasts,



islands, and tundra, south to s.w. Alaska, Great Slave Lake, Hudson Bay, n. Labrador, s. Greenland, Iceland, and n. Eurasia. Largely offshore and pelagic during nonbreeding season, wandering widely chiefly from North Pacific and North Atlantic well into Southern Hemisphere.

TEXAS: (See map.) *Vagrant*: Rare over Gulf waters as close in as continental shelf; casual along coast, where recorded most frequently on upper portion.

HAUNTS AND HABITS: The agile and swift Parasitic Jaeger—like the Pomarine—excels as an air pirate, especially in winter, as it worries terns and other seabirds into surrendering their fish. On the northern breeding grounds, however, it is primarily a hunter and scavenger. Young ducks, small shorebirds, Horned Lark, redpolls, longspurs, and Snow Bunting are prime prey (the Parasitic often devours its catch whole and feathered), as well as the eggs of most species. It also eats shrews, mice, lemmings, carrion, and a few insects and wild fruits.

A circumpolar breeder, it nests in arctic and subarctic latitudes on grassy islands or moors in well-scattered colonies; each jaeger vigorously defends its grass- or lichen-lined cupped nest. In winter, it moves to open seas, often trailing terns as far south as Argentina and the Cape of Good Hope. Although chiefly a pelagic migrant, a few Parasitics, especially in fall, appear coastwise or on inland waterways of North America.

On the wing, the Parasitic maneuvers more like a hawk than a gull and it is as much at home in the air as any of the falcons. Off the breeding grounds, it is rarely seen on the ground; it is an inefficient diver and seldom swims, although when on the water it floats buoyantly and with erect posture.

The Parasitic is typically a quiet hunter; it is usually the gull, kittiwake, or tern that the jaeger is harassing which does the vocalizing. The present species does, however, utter dry *tick a tick-tick's* or *tuk-tuk's*. On the breeding grounds, its wails (one described as a mew-ing *ka-aaow*) and shrieks, sounded on cloudy days or at twilight, are among the most strange of arctic sounds. Exceedingly little is heard from this bird in Texas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (light phase)*: Acquired by partial prenuptial molt. Pileum fuscous; feathers of hindneck with tips of straw yellow; remainder of upper surface dark hair brown; wings and tail fuscous, wing-coverts dark hair brown, shafts of three or four outer primaries yellowish white, becoming on inner feathers increasingly dark brown, until on inner primaries almost of same color as feather itself; lores like crown; remainder of sides of head dull white, tinged with straw yellow; sides of neck pale hair brown, this color tinging white throat and sometimes white chin; breast and abdomen white; crissum hair brown; lining of wing dark hair brown. Bill brownish white or yellowish brown, terminal portion black or brownish slate, mandible paler; eyelids dull gray; lining of mouth dull yellowish flesh color; iris dark brown; legs and feet dull black with some dull bluish gray on face of tarsus. *Adults, nuptial (dark phase)*: Like light phase, except lower parts, sides of head,

and nape are uniform deep hair brown; wing-quills chaetura black. *Adults, winter (light phase)*: Acquired by complete post-nuptial molt. Similar to light phase of nuptial adults, but feathers of crown blackish brown, margined with dull white; nape and sides of neck more or less barred and streaked with dark brown, tips of feathers either rounded or pointed and yellow; lower part of hindneck and upper back barred with pale buff; back and scapulars edged with white; upper tail-coverts much barred with white; sides of head blackish brown with dull white edgings; chin somewhat spotted with dark brown; jugulum narrowly barred with same color; flanks and crissum barred with white. *Adults, winter (dark phase)*: Similar to dark phase of nuptial adults, but in many cases feathers of neck are rounded and lack yellow tips; feathers of upper back often margined with rufous; lower parts slightly barred with pale buff. *Third nuptial (light phase)*: Acquired by partial prenuptial molt. Much like light phase of nuptial adults, but upper tail-coverts sometimes barred with white; some breast feathers tipped with brown, and some of lower wing-coverts or axillars edged or tipped with white. *Third nuptial (dark phase)*: Similar to nuptial adults, dark phase, but upper parts with some feathers tipped with lighter brown; lower parts often somewhat barred. *Third winter*: Acquired by complete postnuptial molt. Like corresponding phase of third nuptial. *Second nuptial (light phase)*: Acquired by partial prenuptial molt. Similar to light phase of third nuptial, but back and sides of neck conspicuously streaked and barred with dull white, buff, and brown; feathers of back and scapulars with white or buff tips, some of wing-coverts tipped with buff; breast, flanks, and crissum barred with pale buff or white; lining of wing and axillars conspicuously barred with white. *Second nuptial (dark phase)*: Similar to dark phase of third winter, but feathers of hindneck sometimes rounded and without yellow, some feathers of back and wing-coverts tipped with buff or rufous; breast and abdomen with broad, partly obscured, bars of buff; crissum, lining of wing, and axillars usually conspicuously barred with buff. *Second winter (light phase)*: Acquired by complete postnuptial molt. Very similar to corresponding phase of second nuptial. Base of culmen buffy olive to grayish olive; nail of maxilla black, somewhat olivaceous at base; remainder of bill chaetura drab; inside of mouth pale russian blue; eye-ring black; iris warm sepia; legs and feet black. *First nuptial*: Acquired by complete postjuvenal molt. Resembling juvenal, corresponding phase, but crown somewhat darker; primaries and primary coverts without tips of buff; lining of wing and axillars conspicuously barred with dark brown. *First winter*: Acquired by wear from juvenal, with which in corresponding phase it is practically identical. *Juvenal (light phase)*: Like light phase of nuptial adults, but top of head much narrowly streaked and spotted with dull pale buff; upper parts, including wings, fuscous, barred, and feathers edged, with pale cinnamon buff, dull white, or russet; longest upper tail-coverts mostly white, broadly barred with fuscous; base of tail white or buffy white; chin, throat, and sides of head dull white or buffy white, much streaked with hair brown; jugulum almost solidly hair brown; sides and flanks white, broadly and conspicuously barred with hair brown or chaetura black washed with pale buff; middle of abdomen and crissum white, former sometimes obscurely spotted with hair brown, latter barred conspicuously with hair brown or chaetura black; lining of wing white, much spotted with hair brown. *Juvenal (dark phase)*: Like dark phase of nuptial adults, but upper parts, particularly crown, cervix, and wings, edged with dull brownish buff; lower parts paler, middle of breast, and particularly abdomen, including crissum, much tinged—or feathers tipped—with snuff brown or sayal brown. Bill bluish gray, darker at tip; iris brown; legs and feet bluish gray with distal half of webs of toes black.

MEASUREMENTS: *Adult male*: Wing, 301.0–340.1 (average, 320.0) mm.; tail, 175.0–235.0 (199.4); bill (exposed culmen), 27.9–35.1 (31.2); height of bill at base, 10.7–13.0 (11.7); tarsus, 39.6–45.5 (41.7); middle toe without claw, 33.0–37.1 (34.8). *Adult female*: Wing, 317.0–341.1 (323.8); tail, 177.0–226.1 (199.7); bill, 28.9–34.5 (31.8); height of bill, 10.4–

12.7 (11.7); tarsus, 39.1–45.0 (42.4); middle toe, 32.0–38.1 (35.8).

TEXAS: *Vagrant*: Three specimens (preserved?): Harris Co., Galveston Bay near La Porte (Apr. 23, 1966, Linda Snyder); Galveston Co., Galveston (prior to 1909, identified by L. B. Bishop); Nueces Co., Corpus Christi Pass (Apr., 1958, fide R. T. Peterson).

LONG-TAILED JAEGER, *Stercorarius longicaudus* Vieillot

SPECIES ACCOUNT

Long-tailed Skua of British authors. The smallest jaeger, with notably slender bill and body. *Adult*: resembles the heavier bodied Parasitic, but with very thin, pointed, highly elongated (may project up to 10 in.) central tail feathers; whiter below without grayish breast-band; blackish cap more distinct (contrasts with broad white or pale yellow collar and paler, almost gray back); less white in primaries; blue-gray (not blackish) legs. Apparently no dark phase. *Immature*: palest (grayer, less brown) of young jaegers with least white in primaries. Length (including tail), 21½ in.; wingspan, 3¼ ft.; weight, 12 oz.

RANGE: Circumpolar on coasts, islands, and tundra within and near Arctic Circle. Largely pelagic during nonbreeding season, apparently ranging mainly over waters of Southern Hemisphere, north sparingly in Atlantic to latitude of s. Europe.

TEXAS: *Casual*: Two sightings in Galveston Co., one substantiated by photographs: over Gulf of Mexico off High Island (1 seen by experienced observer, Nov. 15, 1961, L. E. Williams, Jr.); Bolivar Peninsula near Gilchrist (1 immature, Nov. 27, 1971, Hazel B. Nichols, Jenny Huey; photographed repeatedly in color by J. L. Tveten). One of these photographs, showing bird in flight, was published in black-and-white in *American Birds* 26 (1972): 25; also cataloged as photo no. 26 in Texas Photo-Record File, Texas A&M University.

HAUNTS AND HABITS: Breeding grounds of the Long-tailed Jaeger extend somewhat farther north than those of its relatives. Prime habitat is high moss-and-lichen tundra. Its nest is a scrape hollowed in moss or on a peat mound and lined sparingly with moss and lichens. The erratic distribution of *S. longicaudus* is largely explained by its dependence on lemmings for food; nesting grounds shift from season to season in accord with the whereabouts and abundance of this preferred prey. During winter, the Longtail moves to open sea. Although its migration routes are little understood, it has been recorded inland—at least in northern North America—more than other jaegers. One of the two individuals observed in Texas was flying over open sea in true cold-season jaeger style; the other was photographed in flight as well as on a sand beach squatting, walking, and inspecting a fish head in gull-like manner.

On the wing, the Longtail is more graceful and agile than the Pomarine and Parasitic. It often wind-hovers and also soars high in the air. In summer, the largely

lemming diet is supplemented with field mice, a few small birds and eggs, freshwater fish, crustaceans, and earthworms. It also hawks insects (mayflies, earwigs, butterflies, weevils). Plant matter includes leaves of dwarf willow (*Salix*) and fruit of crowberry; the latter is eaten especially in fall. Fish and surface plankton are mainstays during the Longtail's pelagic wanderings. It often takes marine food in ternlike dives and apparently pirates gulls and terns less than do the other jaegers.

Various calls are sounded about the nesting areas: a shrill, yelping *kree, kree*; a weaker *queek* or *yowk*; a harsh *kreeah, kreeah*; and a rattling *kr-r-r-r, kr-r-r-r, kr-r-r-r, kri, kri-kri-kri*.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage (light phase):* Apparently no dark phase. Acquired by partial prenuptial molt. Pileum black; remainder of head and hindneck straw yellow; rest of upper parts brownish gray, wing-quills and tail feathers darker, shafts of two outermost primaries abruptly, instead of gradually, white; lower parts anteriorly mostly white, posteriorly neutral gray. Bill black at tip, brown at base; iris dark brown; legs and basal parts of toes and webs light bluish gray, rest of toes and webs black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial plumage, but feathers of crown, hindneck, and back tipped with white, not yellow; upper tail-coverts with bars of black and white; band on jugulum dark brown; flanks with dark brown bars; lower tail-coverts marked with dark brown. *Fourth nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult, but with some white-barred or white-tipped feathers on underwing; one or two

white-tipped or barred feathers among those of lower or upper tail-coverts. *Fourth winter:* Acquired by complete postnuptial molt. Similar to fourth nuptial. *Third nuptial:* Acquired by partial prenuptial molt. Similar, in part, to adult in winter and nuptial adult, but feathers of wing-lining much barred or margined with white. *Third winter:* Acquired by complete postnuptial molt. Resembling third nuptial. *Second nuptial:* Acquired by partial prenuptial molt. Similar to first nuptial, but throat and neck with more yellow; back more white-barred; lower surface white with less barring on flanks. *Second winter:* Acquired by complete postnuptial molt. Similar to second nuptial. *First nuptial:* Acquired by complete prenuptial molt from first winter. Similar to first winter, but hindneck with brown markings and yellow feather tips; back and scapulars with many white feather tips; sides of head dull white with fine spots of dark brown; lower tail-coverts, flanks, lower wing-coverts, and axillars barred black and white; upper wing-coverts narrowly margined with white; middle tail feathers much shorter than in adults and tapering abruptly to long points. *First winter:* Acquired by wear from juvenal. Practically identical with juvenal. *Juvenal (dark phase):* Acquired by complete molt from natal. Above brownish black or clove brown, more or less marked with cinnamon and wood brown; below deep buff, barred and mottled with dark brown—or dark brown, broadly barred or otherwise marked with buff. *Juvenal (light phase):* Similar to dark phase but much lighter in color throughout; light edgings of upper parts more conspicuous; head and neck pinkish buff streaked with dark brown; lower parts mostly pale buff or dull white, little marked with dark brown except on sides and lower tail-coverts which are broadly barred with dark brown; long middle tail feathers as in first nuptial but still shorter.

MEASUREMENTS: See Ridgway, 1919, *Bull. U.S. Nat. Mus.*, no. 50, pt. 8, p. 695.

TEXAS: *Casual:* See species account.

Gulls and Terns: Laridae

GLAUCOUS GULL, *Larus hyperboreus* Gunnerus

SPECIES ACCOUNT

A very large, stocky gull. *Adult*: white with pale gray mantle; unmarked white primaries (basally translucent); long heavy yellow bill with red spot near tip of lower mandible; yellow eye-ring and eyes; pink legs. *First winter*: mostly pale buffy (mottled) with white or whitish primaries; blackish-tipped bill, basal two-thirds dull pinkish; brown eyes; pink legs. *Second winter*: similar but usually entirely chalky white; eyes yellowish. Length, 26¾ in.; wingspan, 5 ft.

RANGE: Circumboreal on arctic and subarctic coasts and islands, south to Pribilof Islands, Hudson Bay, c. Labrador, Greenland, Iceland, and extreme n. Eurasia. Winters mainly coastally from edge of open water regularly to n. United States and c. Eurasia, irregularly to s. United States and s. Eurasia.

TEXAS: (See map.) *Winter*: Dec. 8 to mid-May. Casual along coast and on large reservoirs in northern portions. One record for interior south Texas: Starr Co., Falcon Reservoir (Dec. 28, 29, 1971, E. B. Kincaid, Jr., David Simon, et al.; photographed by Winifred Simon, identity confirmed by G. M. Sutton; photo no. 24 in Texas Photo-Record File, Texas A&M University).

HAUNTS AND HABITS: The Glaucous Gull is a bulky bird—almost as big as the Great Black-backed Gull, largest of the Laridae. Though giant, it is otherwise a rather ordinary representative of the world's forty-three gull species. This powerful, heavy-beaked predator nests on arctic and subarctic coastal ledges and high islets. In colonies—usually near auks and other seabirds whose nesting grounds it raids for birds and eggs—it builds a cupped nest of grass, moss, and seaweed. This species is more oceanic than are other large gulls, although a few migrants and wintering birds are found on inland watercourses and lakes. During cold months, as well as patrolling edges of open water, it moves far out to sea to feed at fishing banks. The Glaucous returns early in spring to the Arctic, often arriving before the first good thaw. As with other gulls, it is seen in company with its fellows or others of its family, whether nesting, feeding, or resting, but single individuals are commonly seen.

Glaucous flight, characteristic of large gulls, is particularly strong and at times swift, especially as the bird hawks. It seizes birds (ducks, plovers, other gulls, and various alcids) on the wing; often this gull devours its catch whole, feathers included, or, like an eagle, shreds it while holding it under one foot. In addition to

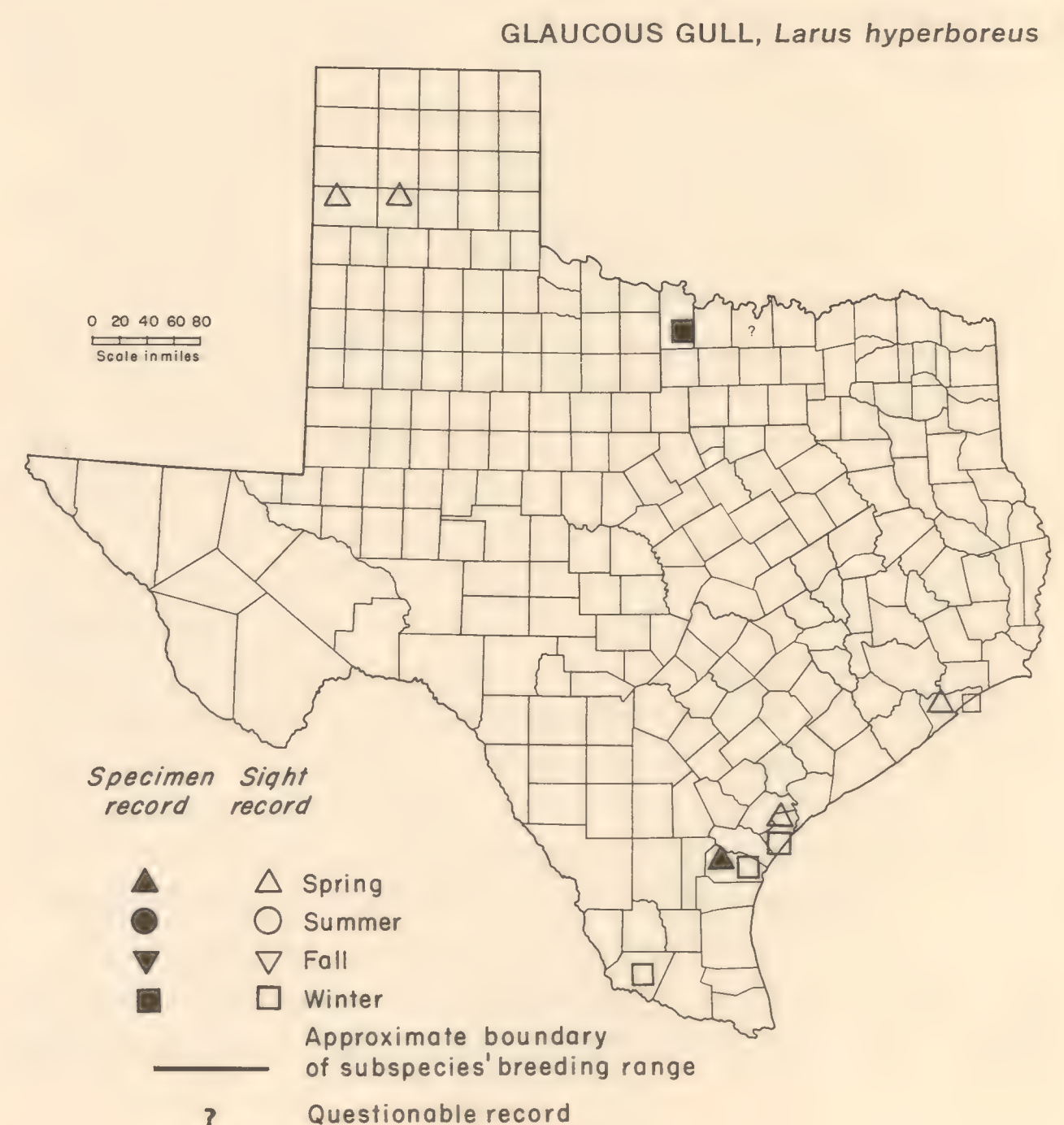
seabird eggs, the Glaucous feeds on fish and mollusks—frequently snatched from other gulls and diving ducks—starfish, sea urchins, and crustaceans as well as any carrion or animal refuse it finds. Although at home on beaches, it walks about slowly; on water it is an adept and buoyant swimmer, as are most gulls.

Harsh nasal croaks, much like a raven's, and more shrill gull-like (also described as eaglelike) screams and cries are sounded by Glaucous Gulls chiefly on boreal breeding grounds.

DETAILED ACCOUNT: TWO SUBSPECIES

EUROPEAN GLAUCOUS GULL, *Larus hyperboreus hyperboreus* Gunnerus

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head, neck, tail, upper tail-coverts, and entire lower parts, including lining of wing, pure white; mantle, including exposed surface of wing, pale gull gray, broad tips of secondaries white, and primaries passing gradually into pure white at tips. Bill gamboge yellow, but cutting edges at base and spot near tip of mandible orange or carmine; inside of mouth flesh color; eyelids dull orange-yellow; bare eye-ring yellow or red; iris yellow; legs and feet pinkish flesh color; claws dull yellow. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but head and hindneck obscurely streaked or suffused with pale brown-



ish gray. Edges of eyelids yellow, feet paler than in nuptial adults. *Fourth nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but crown and primaries often with a few pale brown streaks. *Fourth winter*: Acquired by complete postnuptial molt. Similar to adults in winter, but inner secondaries and some wing-coverts with very slight wash of gray and very fine markings of light brown; primaries more or less tinged with light brown, sometimes finely brown-marked; rump, upper tail-coverts, tail, and lower surface with some fine brown spots, bars, or other markings. *Third nuptial*: Acquired by partial prenuptial molt. Similar to fourth nuptial male and female, but with more fine brown markings on upper surface. *Third winter*: Acquired by complete postnuptial molt. Similar to fourth winter but darker; crown much streaked with brown, and upper parts with much brown and in places narrow bars, mantle with much less gray; lower parts dull white, more or less mottled with brown; wing-quills much tinged with brown and mottled or freckled with this color on parts of inner webs. *Second nuptial*: Acquired by partial prenuptial molt. Resembling third nuptial but paler, very much more extensively white with no gray, in fact almost pure white, or yellowish white, often, however, with some spots, mottlings, and streaks of very pale brownish buff. *Second winter*: Acquired by complete postnuptial molt. Similar to second nuptial male and female, but with more brownish suffusion and streaks; primaries mottled and otherwise marked with light brown. *First nuptial*: Acquired by partial prenuptial molt. Similar to second nuptial but considerably darker, with more brown mottlings or other markings on both upper and lower surface. Basal two-thirds of bill dull or yellowish white, sometimes washed with pink; rest of bill blackish brown or chaetura black; bare eye-ring wood brown to buffy brown; iris massicot yellow or auburn; legs and feet pale flesh color or white washed with brown or pink. *First winter*: Acquired by partial postjuvenile molt. Similar to juvenile but somewhat lighter. *Juvenile*: Acquired by complete postnatal molt. Upper parts dull white or yellowish white, more or less shaded with pale dull pinkish buff, particularly posteriorly, also clouded, spotted, or streaked with pale brownish drab gray; wings and tail pale brownish gray, more or less clouded with white, primaries immaculate, secondaries somewhat mottled with white; chin dull white; remainder of lower surface dull grayish drab, somewhat mixed with dull white; crissum numerously barred with dull white or buffy white. Bill vinaceous buff or pale flesh color, broad tip dark brown or black; eyelids dull bluish flesh color; iris prout brown; legs and feet vinaceous buff or flesh color; sides of claws black, rest drab gray.

MEASUREMENTS: *Adult male*: Wing, 456.9–483.1 (average, 468.1) mm.; tail, 190.0–213.1 (198.1); bill (exposed culmen), 59.9–69.1 (63.8); height of bill at base, 21.1–27.4 (23.6); tarsus, 70.1–79.0 (72.4); middle toe without claw, 57.9–63.5 (60.7). *Adult female*: Wing, 432.1–451.1 (440.9); tail, 183.9–206.0 (191.0); bill, 55.9–61.0 (57.7); height of bill, 19.0–22.1 (20.3); tarsus, 66.0–72.9 (69.1); middle toe, 53.1–61.0 (55.9).

RANGE: Locally in Arctic; in North America, on coasts and coastal islands from Prince Patrick Island to n. Greenland, south to Mackenzie, Keewatin, Labrador, and s. Greenland. Non-breeders summer casually south to n. Manitoba and s.w. Maine. Winters coastally in Northern Hemisphere mainly between lat. 60° N. and 45° N.; in North America, from s.w. Greenland to New York, casually to Texas and Florida.

TEXAS: *Winter*: One specimen: Cooke Co., Gainesville (date unknown, G. H. Ragsdale).

POINT BARROW GLAUCOUS GULL, *Larus hyperboreus barrovianus* Ridgway

DESCRIPTION: *Adults, nuptial plumage*: Similar to *L. h. hyperboreus* but smaller, particularly bill which is actually and also relatively more slender; mantle darker; line of demarcation of white tips of primaries usually more evident.

MEASUREMENTS: *Adult male*: Wing, 444.0–469.9 (average, 458.0) mm.; tail, 178.1–197.1 (189.0); bill (exposed culmen), 55.9–65.0 (61.2); height of bill at base, 20.1–22.1 (20.9); tarsus, 69.1–73.9 (71.1); middle toe without claw, 52.6–59.9 (57.2). *Adult female*: Wing, 424.9–456.9 (436.1); tail, 170.9–

190.0 (180.1); bill, 45.5–59.9 (52.8); height of bill, 17.0–21.1 (18.8); tarsus, 62.0–72.9 (66.0); middle toe, 49.0–55.9 (52.6).

RANGE: On coasts and coastal islands of Alaska, Yukon, and n.w. Mackenzie. Winters mainly coastally from Pribilof and Aleutian islands to s. California (a few), casually to Texas.

TEXAS: *Winter*: Two specimens: Clay Co., Red River (immature, Dec. 17, 1880, A. Hall); Nueces Co., n. Mustang Island near Port Aransas jetty (second-year female, discovered alive, Apr. 10, 1967, collected in May, K. Baker; identified by Clarence Cottam and Roxie C. Laybourne; Welder Wildlife Refuge collection, no. 1357).

[ICELAND GULL, *Larus glaucoides* Meyer

Plumage reportedly similar in all stages to that of Glaucous Gull, but Iceland is a smaller, noticeably trimmer bird with small, round, pigeonlike head; short slender bill (at first dull black, becoming light greenish by second winter); long pointed wings that extend well beyond tail when folded; adult has pinkish brown or dull red (not yellow) eye-ring. One race, *kumlieni*, shows subterminal markings on primaries—grayish in adult, brownish gray in young. Length, 21–24 in.; wingspan, ca. 4½ ft.

The one well-photographed Texas individual was young, as are most out-of-range birds. It appeared smaller than a Herring Gull but about the size of a Ring-billed Gull; it was conspicuous because of its pale coloration, small pigeonlike bill, and the absence of black in its wings and tail. General color was a very pale brownish gray with darker gray subterminal markings on the primaries and tail feathers; primaries and tail seemed rather dark gray when folded; crissum was faintly barred with brownish gray. Bill, eyes, and claws appeared dull black; legs and feet were yellowish pink.

RANGE: Coasts of extreme n.w. Ungava, s. Baffin Island, and s. Greenland, and—at least formerly—Jan Mayen and Iceland. Winters coastally, chiefly from s. Labrador to New York and New Jersey, and from Iceland to British Isles and Scandinavia; rare (though apparently increasing) in Great Lakes region.

TEXAS: *Hypothetical*: One all-day observation: Starr Co. (also adjacent n.e. Tamaulipas, Mexico), Falcon Reservoir just up the Rio Grande from Falcon Dam (1 bird, carefully studied through binoculars and telescopes, Dec. 29, 1971, Edgar B. Kincaid, Jr., G. F. Oatman, Jr., Jim and Nancy Pruitt, Rose Ann Rowlett, David and Winifred Simon, Suzanne Winckler; bird photographed repeatedly in air and on water by Winifred Simon and G. F. Oatman, Jr.). Best photographs were sent to U.S. National Museum where identity of Iceland Gull confirmed by ornithologists John W. Aldrich, Richard C. Banks, Marshall Howe, Roxie C. Laybourne, George Watson, John S. Weske, Alexander Wetmore, and Richard Zusi; one picture by Winifred Simon reproduced in black-and-white in *American Birds* 26 (April, 1972): 445. Some observers suspected that the Texas individual represented the Kumlien's race, *L. g. kumlieni*, judging from the bird's appearance and the subspecies' range. Photograph no. 25 (as of 1973, filed under Thayer's Gull, *L. thayeri*) in Texas

Photo-Record File, Texas A&M University. See POSTSCRIPT.

HAUNTS AND HABITS: The Iceland Gull is a slim graceful version of the big stout Glaucous; both are birds of cold seashores. Though a rather large gull, its small features give it a gentle aspect, and on the wing, it is agile and buoyant. Often in large colonies, it breeds on coastal cliffs of the northeastern Nearctic. The nest, like the Glaucous Gull's, is a bulky mass of moss, grass, and seaweed. Even in winter, most birds wander little from arctic coasts; those few which do move farther south are generally immatures.

In behavior the Iceland is more like its scavenging relative, the Herring, than the predatory Glaucous. It feeds mainly on small live fish which it catches or stranded or dead ones, also dead birds, and quantities of garbage. In addition, it eats a few crustaceans and mollusks, and seeds (barley, oats, and others). Birds-of-the-year, inept at fishing or scavenging, eat a great many crowberries in the North.

Feeding and other behavior of the individual studied in Texas were like that of more southern gulls. Participants in the 1971 Falcon Dam Christmas Count enticed the bird close enough for telephoto exposures by tossing pieces of smoked Christmas turkey into the air; similarly tossed bits of bread, potato chips, cookies, and cakes were somewhat less attractive. When not eating, the Iceland Gull spent most of its time with a flock of Ring-billed Gulls, either floating on or flying over Falcon Reservoir. During the day of December 29, 1971, the rare bird was usually a few yards inside Texas, but once David Simon observed it a very few meters inside Tamaulipas. Thus was perhaps established what is apparently the first record of *Larus glaucoides* for any part of Mexico.

Vocalizations are similar to those of the Herring Gull but shriller. A common greeting of mated pairs is a laughing, high-pitched *kee-orrh*, *korrrh-korrrh-korrrh-korrrh*. Alarmed birds utter a gabbling *ack-ack-ack*, *ack-ack-ack*.

POSTSCRIPT: After publication in black-and-white of the Iceland Gull photograph (*American Birds* 26: 445), the identity of the bird became controversial. By late 1972 and early 1973, gull experts from coast to coast had viewed various color slides or enlarged color prints taken by Simon and Oatman of the strange Falcon Dam gull.

In the autumn of 1972, Californians Guy McCaskie and Joseph R. Jehl, curator of birds at San Diego Natural History Museum, wrote that they considered the bird in question to be undoubtedly a first year Thayer's Gull, *Larus thayeri*. David Simon, one of the observers of the individual at Falcon Dam, and now living in California, stated in a letter dated May 2, 1973: "After examining one of the largest collections of Thayer's Gulls in the world, and many Icelanders, I am convinced that the Falcon bird was a first year *Larus thayeri*."

However, no ornithologist east of California who was consulted would accept a positive Thayer's Gull identification. John W. Aldrich wrote from the U.S.

National Museum, Washington, D.C., on November 20, 1972: "As stated in my last letter to you [E. B. Kincaid, Jr.], it was the opinion of the ornithologists at the National Museum that the photograph matches more closely immature specimens taken in Cumberland Sound identified as *kumlieni* than similar plumaged birds taken on Cornwallis Island identified as *thayeri*." Dr. Aldrich further advised that the gull should be treated in *The Bird Life of Texas* as "... a hypothetical Kumlien's Iceland gull (*Larus glaucoides kumlieni*). Other ornithologists here do not wish to be even that specific."

George M. Sutton wrote on January 24, 1973, from the Stovall Museum at the University of Oklahoma in Norman: "The [picture of the] *flying* slender-billed, white-winged gull I would call *L. glaucoides*." However, in regard to the photograph he examined of the gull afloat, he wrote: "The [picture of the] 'Iceland Gull' in the water with six Ring-billed Gulls seems to me to be too dark-winged and -tailed for *glaucoides* in any plumage."

On April 18, 1973, W. Earl Godfrey wrote from the National Museum of Natural Sciences, Ottawa, Ontario, Canada: "If the photos represent the color of the gull in question with reasonable accuracy, I feel that the bird shown is *L. glaucoides*. In addition to general coloration, the bird appears to have a stubbier bill than is average in *L. thayeri*, and this is true of the average *L. glaucoides*."

In a letter dated April 2, 1973, Paul A. Buckley, research zoologist with the National Park Service, Long Island, New York, wrote: "So, in conclusion, I would say that it is almost certainly NOT nominate *glaucoides* (which I doubt ever gets into the U.S. anyway); it is darker than any young Kumlien's of corresponding age that I have ever seen, but that form as [Neal] Smith demonstrated, is highly variable; it *might* be, by elimination, Thayer's, but it seems too dove-headed and too much an obvious whitewing (cf. original identification) to be Thayer's if many Arctic people are correct."

The senior editor, Edgar B. Kincaid, Jr., as of June 28, 1973, hereby concludes the following: The strange Falcon Dam gull cannot be diagnosed with certainty. Therefore, in this book the species should be treated as hypothetical and recorded under the name Iceland Gull, *Larus glaucoides*, since this was the identification which first appeared in print.]

[**GREAT BLACK-BACKED GULL**, *Larus marinus* Linnaeus

An extremely large gull; has pink legs. *Adult*: white with blackish mantle; white border along trailing edge of wing (outermost primary broadly white-tipped); heavy yellow bill with red spot near tip of lower mandible; grayish or yellowish eyes. *Immature*: resembles smaller second-winter Herring Gull, but head and body whiter, mantle less brown and more uniformly dark; tail with rather broad (rather narrow by second winter), blackish subterminal band; heavy bill largely

blackish (never mostly pink); dark brown eyes. Length, 29½ in.; wingspan, 5½ ft.

RANGE: Chiefly along coasts of e. Canada, n.e. United States, w. Greenland, Iceland, and n.w. Europe. Winters south to Great Lakes region, along w. Atlantic to s. Florida, and Mediterranean and Caspian seas.

TEXAS: *Hypothetical:* Two sightings on central coast: Aransas Co., Rockport (immature, Feb. 21–27, 1949, Connie Hagar, Mr. and Mrs. R. P. Klein; immature, Feb. 23, 1953, C. D. Brown, J. L. Edwards).]

LESSER BLACK-BACKED GULL, *Larus fuscus* Linnaeus

SPECIES ACCOUNT

Adult: closely resembles much larger Great Black-backed, but legs yellow (not pink); outermost primaries with less white; mantle of British race not as black. Resembles dark-eyed Western Gull (length 25 in.) of U.S. Pacific coast, but eyes and legs yellow (Gulf of California race of Western also has yellow eyes and legs); from below, primaries mainly white (largely black in Western). **Immature:** resembles young Herring Gull (very young birds usually indistinguishable in field), but sooty brown mantle of near-adult decidedly darker; legs may remain pinkish through third year and even into fourth. Length, 21 in.; wingspan, 4¾ ft.

RANGE: Iceland and n. Europe, south to British Isles, Channel Islands, and coast of n. France. Winters mainly from British Isles, s. Norway, and Baltic region to c. Africa, Red Sea, and Persian Gulf; rarely along w. Atlantic from Maritime Provinces very locally to New Jersey.

TEXAS: *Casual:* One documented sighting on upper coast: Galveston Co., Texas City Dike (subadult, Nov. 28, 1969, to at least early Apr., 1970, Linda Snyder, Mr. and Mrs. G. W. Venatta, et al.; identification confirmed by scores of seasoned observers, and documented with photographs in *Audubon Field Notes* 24 [1970]: 519–520; this individual was thought to be a more mature version of a suspected Lesser Black-backed present at same place during winter, 1968–69; a bird considered to be the same individual returned for apparently its third winter, 1970–71). Additional sighting, apparently of different individual: Galveston Co., south jetty (1 adult, Jan. 28, 1973, Noel Pettingell, E. N. McHenry). One central coast record: Nueces Co., near Port Aransas (adult, Mar. 29, 1952, C. D. Brown, R. H. Herbert, J. L. Edwards, et al.).

HAUNTS AND HABITS: The Lesser Black-backed Gull is so called because it resembles a small Great Black-backed, but the smaller bird is believed by most ornithologists to be more closely related to the Herring Gull.

In habitat and behavior, the Lesser Black-backed of Europe and the circumpolar Herring are so nearly identical that bird watchers are hard put to find any difference at all. However, the present species is reported to nest more often on the ground than on cliff

ledges, to migrate somewhat farther south, and to be rather more aggressive at times.

Voice is similar to that of the Herring Gull, but some notes are a bit lower pitched.

NOTE: The extremely few individuals of *Larus fuscus* which have appeared along the Gulf of Mexico coast were probably of the British race, *L. f. graellsii* Brehm, but no specimens have been taken in Texas, and generally speaking it is not feasible, or even honest, to identify subspecies through binoculars or from photographs.

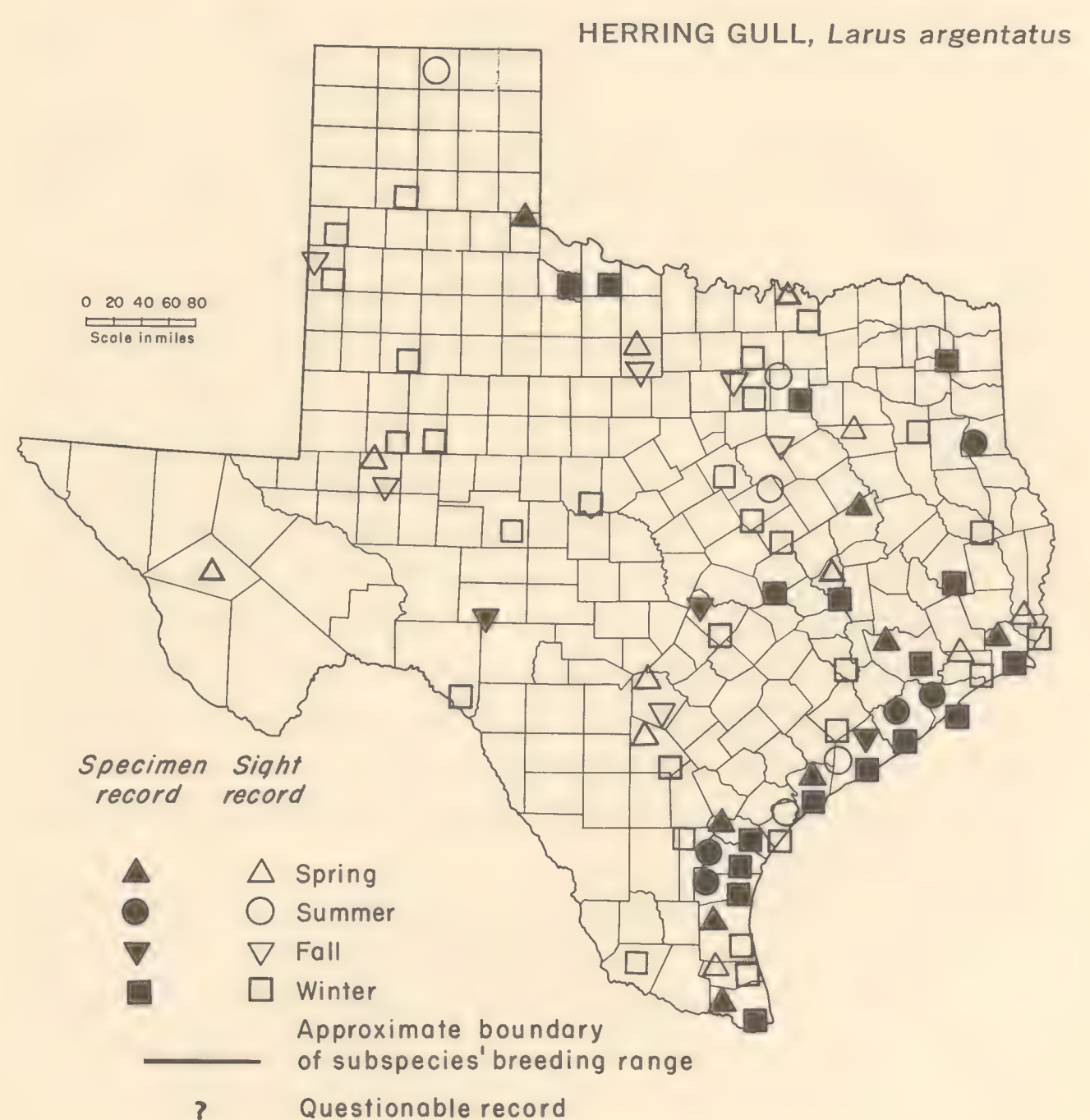
HERRING GULL, *Larus argentatus* Pontoppidan

SPECIES ACCOUNT

A large, heavily built gull; has pink legs. **Adult:** white with gray mantle; black wing-tips with a few white spots; sturdy yellow bill with red spot near tip of lower mandible. **First winter:** mostly dark brown (mottled); bill blackish. **Second winter:** whiter; tail with broad, blackish terminal band (often entire tail dark brown); tail white basally, mottled with brown; rump white; terminal third of pinkish bill black with white tip. Length, 24¼ in.; wingspan, 4¾ ft.; weight, 2¼ lbs.

RANGE: Circumboreal in Northern Hemisphere; in North America, from Arctic coast, south to British Columbia, Great Lakes region, and along Atlantic to Long Island. Winters south to southern parts of Northern Hemisphere; in New World, from southern limits of breeding range, south along Pacific to El Salvador and along Atlantic to Panama (a few), and in West Indies; locally through interior of continent from Great Lakes to Mexico.

TEXAS: (See map.) *Winter:* Mid-Sept. to late Apr.—



a few to mid-May (extremes: Aug., early June). Common to uncommon along Gulf coast; irregularly fairly common to scarce inland east of Pecos River; accidental in Jeff Davis Co. (recorded in May, Pansy Espy). Nonbreeders oversummer irregularly on coast.

HAUNTS AND HABITS: The large, stocky Herring Gull, abundant and widespread in cooler parts of the Northern Hemisphere, is the best known gull. Its behavior has perhaps been more studied than that of any other wild bird. Breeding colonies are located on open, rocky, or weed-tangled flats of islands along seacoasts or in lakes, also on sand dunes or cliffs; on the ground (a tree may be used if the bird has been disturbed), the Herring builds a shallow-cupped nest in a crude pile of seaweed and rubbish.

During cool months, this gull is a familiar figure in Texas. Here, as elsewhere, it is most numerous coastally, but any large inland body of water is subject to visitations by migrants or wintering birds. Even though it gets to almost as many localities in the state as does the Ringbill, the Herring is ordinarily considerably less numerous. Since first- and second-year individuals migrate farther than adults, most Herring Gulls that reach Texas are immature. Both Herrings and Ringbills summer as nonbreeders on the Gulf coast. Highly gregarious, the Herring performs its activities in companies—nesting, feeding, sleeping, and resting.

Flight is strong and rather direct, not particularly swift, and performed with moderate, sometimes rather slow, wing-beats. Like many of the large gulls, the Herring rides gales without moving its wings and progresses at considerable speed simply by giving them the proper slant. Flocks often rise in vertical circles to soar high in the blue sky. This useful scavenger follows fishing boats to glean refuse tossed overboard; it also feeds avidly on the increasing amounts of garbage and sewage dumped in coastal waters. This American "sanitation" practice has, in fact, increased the food supply for all coastal scavengers. On beaches at surf's edge, the Herring Gull treads rapidly upon sand and mud to churn up crustaceans, marine worms, and shell fish; to open a hard-shelled clam, the bird often carries it into the air and drops it on rocks or concrete. This gull catches most of its fish in shallow pools left when the tide is out. The Herring's miscellaneous diet also includes insects, eggs of seabirds, small birds and mammals, and some wild fruit. Toward evening after a day's feeding, Herring Gulls return to their roosts on an island sandbar, protected inland watercourse, or isolated open field or marsh; at this time they usually fly low over the water singly or in straggling companies. The bird is entirely at home on water, floating buoyantly as it rests on the surface. Groups of these birds, like many other gulls, occasionally move a short distance inland from the coast to fresh water in order to bathe, drink, and rest.

Herring Gull vocalizations are quite varied in pitch, quality, and volume. One utterance has been described as sounding like foxhounds at full bay. Also sounded are hard guttural *tuk, tuk, tuk's*, dry *kak-kak-kak's*, a loud trumpeting *kyoo* (also described as *kyow*) sev-

eral times repeated, and a long, drawn-out catlike mew. These birds are less vocal in Texas than in northern climes where they breed.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN HERRING GULL, *Larus argentatus smithsonianus* Coues

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Head, neck, upper tail-coverts, tail, lining of wing, and entire under parts white; back, scapulars, wings, and rump between pallid neutral gray and pale neutral gray; secondaries and inner primaries broadly tipped with white; outermost primaries chaetura black terminally, most extensive on outermost which has a large white spot near end, and all other primaries tipped with white, black areas on these feathers more extensive on outer web, and on inner web of second primary enclosing a distinct wedge of gray. Bill chrome yellow, light cadmium, or empire yellow, with spot of vermilion, coral red, flame scarlet, or orange on side of mandible at angle of gonys, and sometimes in front of this a small black spot; inside of mouth vermilion or empire yellow; eye-ring light orange-yellow, mikado orange, or vermilion; iris pale straw yellow, pale orange-yellow, naples yellow, cream color, or silvery white; legs and feet light flesh color, straw yellow, venetian pink, or alizarine pink, but front of tarsus sometimes tilleul buff, and joints dull green; claws slate black, brownish black, or black, somewhat paler at base. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head, sides, and back of neck streaked with hair brown or drab, most broadly on hindneck. Bill colors duller than in nuptial, greater part cream color, tinged with maize yellow or naples yellow on culmen, mandible with spot of coral red, or black and rufous, at angle of gonys; iris cream color or straw yellow; legs and feet smoke gray, pale vinaceous pink, or vinaceous buff. *Fourth nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but tail often with dark brown areas. *Fourth winter:* Acquired by complete postnuptial molt. Similar to adults in winter, but tail often with dark brown areas; mantle sometimes with traces of dark brown; breast streaked with brown. *Third nuptial:* Acquired by partial prenuptial molt. Similar to fourth nuptial, but usually with more, often extensive, brown areas on tail; primaries sometimes all dark brown; if black, tip of second primary usually with less white, and sometimes more or less freckled with brown; some secondaries and primary coverts usually spotted or speckled with brown; breast and abdomen often mottled with brown. Bill sometimes with dark brown bar; iris rarely dark brown. *Third winter:* Acquired by complete postnuptial molt. Resembles fourth winter, but primaries and tail often all dark brown; upper tail-coverts often with extensive brown areas; head and mantle, with breast and abdomen, often mottled brown. Bill sometimes with dark brown bar; iris occasionally dark brown. *Second nuptial:* Acquired by partial prenuptial molt. Similar to third nuptial, but primaries and tail dark brown; upper tail-coverts often extensively dark brown; mantle all or mostly dark brown; head, neck, and lower parts brown to dull white streaked with brown. Basal two-thirds of bill cartridge buff, pale olive buff, pale pinkish cinnamon, pinkish white, greenish white, or vinaceous buff; terminal third slate black or black, tipped with white; inside of mouth pinkish vinaceous; eye-ring avellaneous or drab to black; iris colonial buff, amber yellow, sulphur yellow, straw yellow, pale straw yellow, or dark brown; legs and feet pale pinkish buff, pale pinkish cinnamon, light grayish vinaceous, pale ecru drab, pale olivaceous fawn, pinkish white, vinaceous pink, or pinkish olivaceous; claws black or slate black. *Second winter:* Acquired by complete postnuptial molt. Similar to third winter, but primaries always dark brown and often mixed with gray; head, neck, and lower parts much washed or spotted with hair brown or drab; tail white basally, but otherwise as in juvenal. *First nuptial:* Acquired by partial prenuptial molt. Similar to first winter. Bill all dull black or with terminal third or half black or slate black, but tip dull white; rest of bill pale ecru drab, ecru drab, grayish vinaceous,

dull cream color, drab, pale grayish vinaceous, or benzo brown mottled with white; inside of mouth pinkish white or light grayish vinaceous; iris brussels brown, argus brown, mars brown, or isabella color; legs and feet pinkish white, bluish cream color, light vinaceous fawn, pale purplish vinaceous, grayish vinaceous, dull cream color, or pinkish ecru drab, but toes sometimes light russet vinaceous; claws black or brownish black. *First winter*: Acquired by partial postjuvinal molt. Similar to juvenal, but anterior upper parts somewhat paler and less heavily streaked; back and scapulars lighter and more buffy, feathers partly buff with subterminal brown bar. *Juvenal*: Acquired by complete postnatal molt. Above and below mostly hair brown; crown with numerous streaks of dull white; back with slight edgings of pale grayish or buffy white, back, rump, and upper tail-coverts barred or spotted with white or pale dull buff; tail and wing-quills fuscous or fuscous black, the latter paler on inner webs; secondaries broadly tipped with white or buffy white, and all wing-quills spotted or barred with dull white or pale dull buff; chin and middle of throat white, streaked with hair brown or drab; sides of head and of neck, with jugulum and breast, more or less spotted with dull white or pale dull buff; abdomen, flanks, and crissum broadly barred with white or buffy white. Bill entirely dull black or with about terminal third dull black; base whitish; middle part of maxilla drab gray to ecru drab; middle portion of mandible pale olivaceous fawn; inside of mouth light vinaceous fawn; eye-ring dark hair brown or dull flesh color; iris warm sepia; legs and feet pale vinaceous fawn; claws black.

MEASUREMENTS: *Adult male*: Wing, 405.1–460.0 (average, 433.8) mm.; tail, 151.1–190.0 (175.3); bill (exposed culmen), 49.0–62.0 (56.9); height of bill at base, 17.0–22.6 (19.6); tarsus, 59.9–73.9 (67.8); middle toe without claw, 50.0–59.9 (55.3). *Adult female*: Wing, 397.0–421.9 (410.7); tail, 153.9–178.1 (165.4); bill, 47.0–53.1 (50.3); height of bill, 16.0–18.0 (17.0); tarsus, 56.9–66.0 (62.2); middle toe, 47.0–53.1 (50.3).

RANGE: On coasts, lakes, and rivers from c. Alaska to s. Baffin Island, south to British Columbia, e. Montana, and n. Ohio, and along Atlantic to New York, casually to n. Virginia. Nonbreeders summer south to Texas and Florida. Winters coastally from s. Alaska to El Salvador, and from Newfoundland to Panama, and in West Indies; also inland on Great Lakes south chiefly along the Mississippi River and its tributaries to Gulf of Mexico.

TEXAS: *Winter*: Taken northwest to Childress (May 1), Foard, and Wilbarger, east to Morris and Jefferson, south to Cameron, west to Sutton (Nov. 29) cos.

CALIFORNIA GULL, *Larus californicus* Lawrence

SPECIES ACCOUNT

Adult: closely resembles smaller, paler mantled Ring-billed Gull, but bill with red, or red-and-black, spot near tip of lower mandible; shows more white on wing-tips; from below, sharply defined black wing-tip cuts straight across primaries Kittiwake-like; legs greenish yellow. *Immature*: closely resembles larger young Herring (often indistinguishable in field), but slighter, black-tipped pinkish bill (not all blackish); legs of second-year bird becoming greenish (not pinkish). Length, 20¾ in.; wingspan, 4¼ ft.

RANGE: Interior North America from upper Mackenzie, south locally to n.e. California, n.w. Nevada, n. Utah, n.w. Wyoming, and c. North Dakota. Winters chiefly along Pacific from s. British Columbia to Guatemala; inland locally in Great Basin; a few along Gulf coastal Texas.

TEXAS: (See map.) *Winter*: Oct. 8 to May 14. Rare to casual along Gulf coast. Two inland records: Frio

Co., Jensen Lake near Moore (2 adults, Oct. 8, 1929, H. C. Oberholser); Webb Co., Laredo (see detailed account).

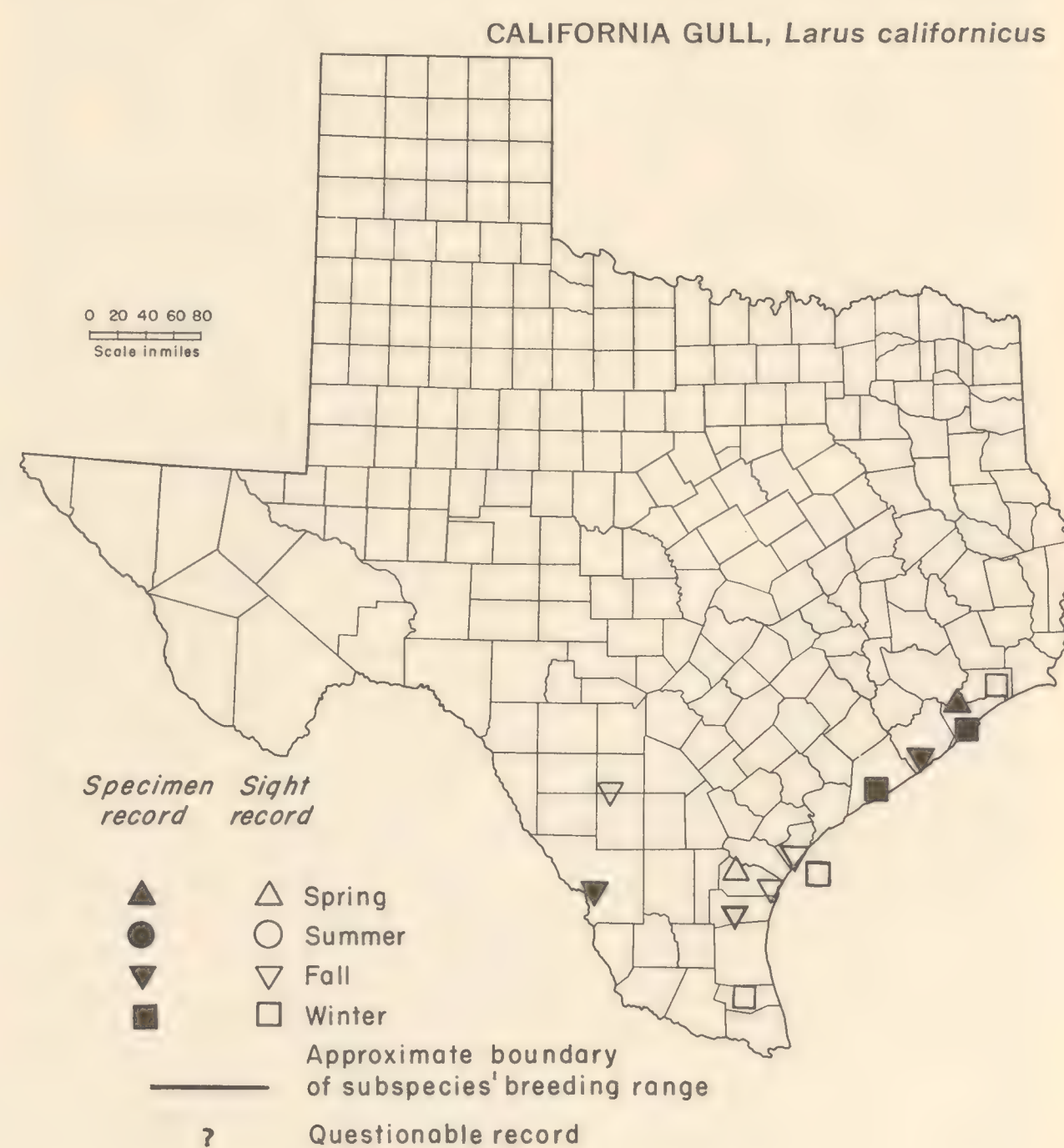
HAUNTS AND HABITS: The California Gull's propensity for insects—a trait shared with many other inland-ranging gulls—is responsible for saving crops of early-day Mormons from devastations of the Mormon cricket, a species of long-eared grasshopper; a monument honoring the gull was subsequently erected in Salt Lake City, Utah. This bird breeds in colonies near large lakes—fresh, alkaline, or salt—and their marshes, where it lays its three brown-spotted olive buff eggs in a scantily lined scrape on bare ground. In winter, *Larus californicus* moves to the Pacific coast; a few individuals straggle to Texas Gulf beaches and bays. Like other large North American gulls, it at times gathers into sizable flocks, either with its fellows or in association with other species, chiefly Herrings and Ringbills.

In flight, it is very similar to the Ringbill; in fact, unseasoned observers have difficulty distinguishing the two gulls on the wing. In a good stiff breeze, the California, like other gulls, poises in mid-air practically motionless, making subtle, often indiscernible, wing adjustments to compensate for changing air currents. Particularly on the wintering ground, the bird trails boats and scavenges harbors and dumps for garbage. On inland haunts, in addition to crickets, grasshoppers, cutworms, and mice, it sometimes eats crayfish and fish (such as carp), plus an occasional bird egg.

For the most part, the California Gull restricts its soft *kuk kuk kuk*'s and high-pitched *kyarr*'s to the breeding and feeding areas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head, neck, upper tail-coverts, tail, lining of



wing, and entire lower surface white; mantle, including wings, between pale neutral gray and light neutral gray, inner primaries and all secondaries broadly tipped with white, inner webs becoming basally almost white; six outer primaries fuscous black subterminally, this most extensive on outer webs, outermost primary tipped with white and with a subterminal black spot or bar and long spot of white, second primary similar, the black basally enclosing broad wedge of gray, next three primaries broadly tipped with white, sixth tipped with white and with subterminal bar of black. Bill chiefly yellow, light orange-yellow, deep chrome, cadmium yellow, pale greenish yellow, maize yellow, or baryta yellow, often tipped with white, also with a spot at angle of mandible, and another above it on maxilla, black or dark brown, and behind spot on mandible a patch of orange, salmon orange, orange vermilion, vermilion, flame scarlet, scarlet, mikado orange, brazil red, grenadine red, or carmine; inside of mouth orange, orange chrome, flame scarlet, grenadine red, coral red, orange vermilion, light orange-yellow, or cadmium yellow; eye-ring brazil red, scarlet, flame scarlet, orange chrome, or vermilion; iris yellow, aniline yellow, cream color, yellowish brown, antique brown, chestnut brown, raw umber, vandyke brown, or olive buff on inner ring, bone brown outwardly; legs and feet primrose yellow, naples yellow, buff yellow, baryta yellow, maize yellow, or sulphur yellow, joints dull green or puritan gray; claws black, chaetura black, light seal brown, bone brown, or avellaneous. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but head and neck broadly streaked with hair brown or chaetura drab. Bill mostly maize yellow, dull maize yellow, wax yellow, dull pale chalcedony yellow, pinard yellow, yellowish olive buff, ocher yellow, pale lumiere green, pale pea green, or cream color; iris broccoli brown, buckthorn brown, brussels brown, auburn, old gold, olive ocher, ocher yellow, or massicot yellow; legs and feet cream color or court gray, yellowish light mineral gray, sage green, pale fluorite green, light niagara green, or pale pea green; claws black, slate black, or brownish black. *Third nuptial*: Acquired by partial prenuptial molt. Like nuptial adults, but throat and breast with a few dark markings; head and neck sometimes so; tail with some black subterminally. Bill, legs, and feet showing various combinations of colors of these parts as in nuptial adults and second nuptial. *Third winter*: Acquired by complete postnuptial molt. Very similar to adults in winter, but tail feathers often with subterminal markings of black or dark brown; head, neck, throat, and breast with a few dark markings. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but secondaries with considerable black terminally, inner primaries light brown; no white on tips of primaries; terminal part of tail black or mottled with brown; head, hindneck, throat, and breast more or less marked with brown. Basal two-thirds of bill dull maize yellow, dull antimony yellow, bluish white, greenish white, pinkish buff, dull straw yellow, yellowish cream color, pale tilleul buff, pale pearl gray, pale lichen green, light mineral gray, pale dull glaucous blue, pale bluish glaucous, dawn gray, or court gray, or various combinations of these colors, and its terminal third or less black or dull brown, tipped with white, and with spot of deep chrome or capucine orange on mandible; inside of mouth tilleul buff, pale flesh color, mikado orange, cream color, buff yellow, orange chrome, orange, olive buff, pale bluish glaucous, or orange buff; eye-ring black, olivaceous black, tawny, orange, ochraceous orange, or english red; iris auburn, raw umber, russet, dresden brown, brussels brown, vandyke brown, or bone brown; legs and feet light mineral gray, puritan gray, pale pinkish buff, greenish buff, pallid quaker drab, greenish cream color, greenish white, tilleul buff, lumiere green, dull massicot yellow, pinkish white, pallid mouse gray, sky gray, pale vinaceous fawn, lichen green, pale king blue, dull glaucous blue, pale russian blue, or pale medici blue; tibia, tarsus, toes, webs of toes, and joints often showing some combination of these colors; claws black, slate black, or brownish black. *Second winter*: Acquired by complete postnuptial molt. Similar to second nuptial. Bill dull yellow, tip brownish black; legs and feet flesh color or pale dull green. *First nuptial*: Acquired by partial prenuptial molt. Similar to second winter, but back duller with some dark markings; tail brown with no white; upper surface of wing more extensively

brown or blackish brown. Bill pinkish white, greenish white, pale olive gray, pale vinaceous, fawn, cream white, or pinkish buff, but terminal third black; inside of mouth pinkish, creamy white, or pinkish vinaceous, light coral red, salmon orange, or cream color at edge; eye-ring black; iris vandyke brown, chestnut, or auburn; legs and feet pale green-blue gray, pale olive buff, pale brownish drab, or tilleul buff, but joints dull blue, and bare part of tibia pale russian blue or pale green-blue gray; claws black. *First winter*: Acquired by partial postjuvenile molt. Similar to juvenile, but upper parts darker, although feathers with narrow light edgings; tail plain dark brown; upper tail-coverts with less barring; lower surface lighter. *Juvenile*: Acquired by complete postnatal molt. Upper and lower parts hair brown, head and hindneck narrowly streaked with dull white, back, scapulars, and wings broadly edged and spotted with pale buff and dull white, rump and upper tail-coverts barred with same; tail fuscous or fuscous black, mottled with white or dull pale buff terminally and on bases of feathers; wing-quills fuscous or fuscous black, lighter on inner webs, secondaries tipped with brownish white; wing-coverts similar to back but greater coverts less mottled, being nearly plain except on ends; lower parts hair brown, chin almost white, throat broadly streaked with white, remainder of lower surface mixed with white or buffy white; lower tail-coverts broadly barred with dull white. Terminal third or half of bill slate black or black, basally pale ecru drab, brownish white, pinkish white, pale olive buff, pinkish buff, avellaneous, cream color, wood brown, flesh color, or tilleul buff; inside of mouth white, pink, flesh color, or calliste green; eye-ring black; iris prout brown, auburn, warm sepia, or raw umber; legs and feet blackish brown, pale vinaceous fawn, flesh color, tilleul buff, brownish white, pallid mouse gray, hair brown, or drab; claws black.

MEASUREMENTS: *Adult male*: Wing, 381.0–428.0 (average, 407.2) mm.; tail, 140.0–163.1 (154.2); bill (exposed culmen), 44.4–54.6 (49.8); height of bill at base, 16.5–20.1 (18.3); tarsus, 51.6–63.0 (57.2); middle toe without claw, 46.0–55.1 (51.3). *Adult female*: Wing, 364.0–402.1 (381.8); tail, 144.0–165.6 (150.1); bill, 41.9–52.6 (45.2); height of bill, 14.0–17.0 (15.5); tarsus, 47.0–59.4 (52.3); middle toe, 45.0–52.6 (47.8).

TEXAS: *Winter*: Taken along coast in Galveston, Brazoria (Nov. 29), and Matagorda cos. One inland specimen: Webb Co., Laredo (Oct. 10, 1866, H. B. Butcher).

RING-BILLED GULL, *Larus delawarensis* Ord

SPECIES ACCOUNT

Adult: resembles larger Herring Gull, but has black subterminal band encircling bill; yellow or greenish yellow legs; considerably more black on underside of primaries. *Immature*: closely resembles young Herring, but subterminal black tail-band much narrower; most of tail white; rump mottled with brown. Length, 16¼ in.; wingspan, 4 ft.; weight, 1 lb.

RANGE: Cool temperate North America (chiefly interior) from c. Washington to n. Saskatchewan, s. Ontario, and Newfoundland, south locally to n.e. California, s. Idaho, n.e. South Dakota, and Great Lakes region. Winters widely from British Columbia, Great Lakes region, and New England to El Salvador, casually to Panama; also Cuba.

TEXAS: (See map.) *Winter*: Early Sept. to late May (extremes: Aug., June). Abundant to fairly common along Gulf coast and locally along Red River; irregularly common to uncommon in remainder of state, but scarce to rare in much of Trans-Pecos. Nonbreeders oversummer along coast and irregularly on large inland reservoirs.

HAUNTS AND HABITS: Ring-billed Gulls colonize—often with other gulls, terns, and the Double-crested Cormorant—isolated coastal flats and inland lake shores and their islets in Canada and northern United States; now as in Audubon's time the Ringbill seems to be the most numerous North American gull. Upon the ground (very rarely in a low tree), usually amid rocks and boulders, it builds a nest of dried grasses and a few sticks. In Texas it is found on Gulf beaches, bays, and lagoons and freshwater ponds, lakes, rivers, and streams; it is the only gull likely to winter inland in force. Densely gregarious on the nesting grounds, the Ringbill more often appears singly or in loose flocks throughout its winter and migration range.

Ringbill flight and habits are quite similar to those of its larger relative, the Herring Gull; on the wing, however, the present species is rather lighter. It scavenges, especially during winter, in the usual gull manner by trailing boats and patrolling wharves and garbage dumps. Food chiefly is picked from the surface of the water, but at times this gull—like a shorebird—feeds at wave's edge on beaches for crustaceans. Inland, Ringbills follow the plow, aiding farmers by devouring, on the ground or in mid-air, quantities of insects, especially grubs and grasshoppers; it also eats field mice and other small rodents. This bird typically alights on water with feet dangling and both wings held high above its head; it swims readily and buoyantly and rises effortlessly from the surface.

The ordinary call of the Ring-billed Gull is an excited *kre, kree, kreee*, etc., higher keyed than Herring Gull vocalizations. Ringbills are often noisy when they are avidly feeding, but otherwise they are fairly quiet in Texas.

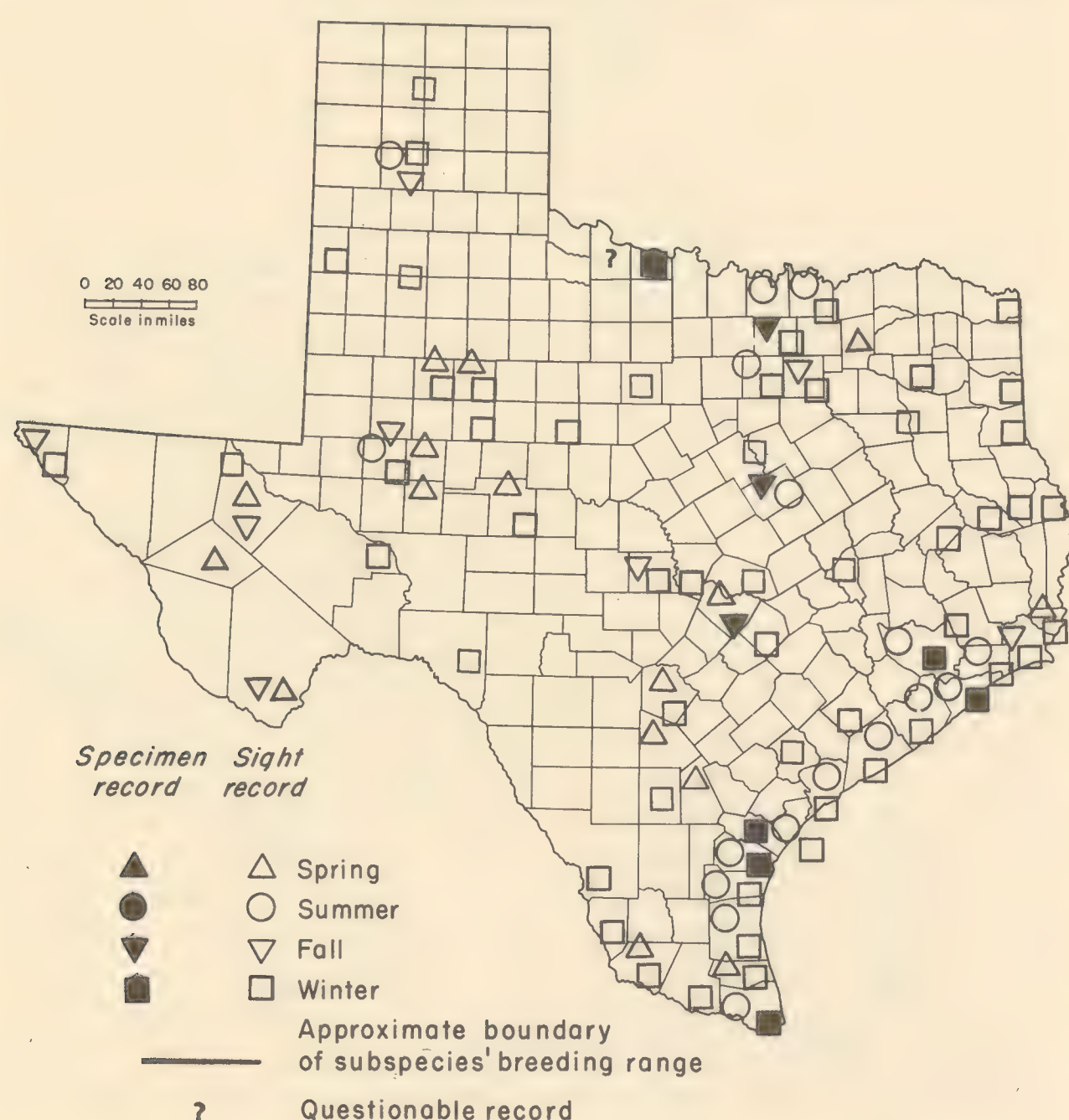
CHANGES: This abundant American gull apparently declined somewhat in the early 1900's, but between

1950 and 1970 it increased. Someone should do a study to determine why the Ringbill is going up when practically every other water bird in the world is going down!

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Head, neck, upper tail-coverts, lining of wing, and entire lower parts white; back, scapulars, rump, and upper surface of wings between pale neutral gray and gull gray, secondaries broadly tipped with white; terminal portion of six outer primaries largely chaetura black or fuscous black, most extensive on outer webs, decreasing to a mere spot on sixth, outermost with large white spot on both webs near tip, second similar but also tipped with white and with white subterminal area, others with black portion tipped with white, black on second and third primaries enclosing a broad gray wedge on inner webs. Bill sulphur yellow, apricot yellow, or greenish yellow, with blackish band near end, tip tinged with orange or primrose yellow, corner of mouth and eyelids vermilion, flame scarlet, or cadmium orange; interior of mouth orange-red; iris straw yellow or buff yellow, sometimes with greenish tinge; legs and feet wax yellow, maize yellow, pale orange-yellow, naples yellow, or greenish yellow, webs of toes sometimes tinged with orange; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head and neck streaked with hair brown, throat unmarked and with small spots of drab. Bill apricot yellow, olive yellow, primrose yellow, marguerite yellow, or pale olive gray, but with band of black on terminal portion, and tip buff yellow, yellowish white, or dull apricot yellow; inside of mouth flame scarlet, scarlet, grenadine red, or ochraceous orange; eye-ring brazil red, mahogany red, or black; iris naples yellow, pale orange-yellow, maize yellow, or pinard yellow; legs and feet maize yellow overlying gull gray, baryta yellow, naples yellow, or light cadmium, but sometimes tarsus pale grass green in front, and webs of toes hair brown; claws black. *Third nuptial:* Acquired by partial prenuptial molt. Like nuptial adults, but bill chrome yellow, pale pinkish vinaceous, greenish yellow, dull pea green, wax yellow, cream color, baryta yellow, or light ochraceous buff, with broad bar of black near tip, which is dull white, buffy yellow, light wax yellow, pale orange-yellow, or orange; eye-ring flame scarlet or black; iris vandyke brown, pale viridine yellow, yellowish gray, dull massicot yellow, or marguerite yellow; legs and feet dull chrome yellow, buff, yellowish drab, wax yellow, massicot yellow, naples yellow, or olive buff, but webs between toes sometimes hair brown, yellowish drab, or saccardo umber; claws black, chaetura black, or brownish black. *Third winter:* Acquired by complete postnuptial molt. Similar to adults in winter, but white subterminal spot on outer primary absent or very small; tertials more or less marked with dark brown or brownish slate; some indication of black subterminal band on tail. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but lesser wing-coverts, tertials, and secondaries somewhat mottled with dark brown; primaries brownish black without markings; tail with broad subterminal blackish brown band. Basal two-thirds of bill light dull greenish yellow, buffy yellow, pyrite yellow, cream color, pale pinkish buff, pinkish buff, olive buff, light buff, pale fluorite green, pale orange-yellow, deep chrome, or cadmium yellow; remainder of bill with broad black bar and tip of maize yellow, pale sulphur yellow, cream color, chrome yellow, warm buff, cinnamon buff, orange-yellow, massicot yellow, yellowish white, or white; inside of mouth buff yellow, chrome yellow, orange chrome, flame scarlet, orange buff, capucine buff, pale orange-yellow, mikado orange, scarlet, or salmon orange; eye-ring black washed with chestnut at posterior canthus, scarlet, brazil red, or black; iris sulphur yellow, baryta yellow, naphthalene yellow, straw yellow, cream color, pale sulphine yellow, pale viridine yellow, ochraceous buff, auburn, light drab, or brownish cream next to pupil and apricot brown peripherally; legs and feet sulphur yellow, pyrite yellow, olive buff, grayish cream color, maize yellow, naples yellow, old gold, pinkish buff, olive buff, pale yellow-

RING-BILLED GULL, *Larus delawarensis*



orange to pale orange-yellow, baryta yellow, cream color, or court gray washed with yellow, but webs of toes sometimes light drab or saccardo umber; claws black, slate black, brownish black, although often drab or dull white at tips. *Second winter*: Acquired by complete postnuptial molt. Similar to adults in winter, but primaries without broad white tips; wings otherwise much as in first winter; upper tail-coverts and sides of body spotted with drab; tail mottled with dull white or grayish white and with broad subterminal band of fuscous or fuscous black. Bill yellow or flesh color, with broad dark brown band at tip; iris dark brown or grayish yellow, feet dull yellow, dull brown, or flesh color. *First nuptial*: Acquired by partial prenuptial molt. Similar to second nuptial, but head with very much more brown; lower parts with much admixture of dull brown; remainder of plumage very much like that of first winter. Bill pale pinkish buff, warm buff, light buff, pale ochraceous buff, or pale flesh color, but with broad subterminal band of black and a white or antimony yellow tip; eye-ring black or dull morocco red; gape zinc orange; iris dull ochraceous buff or prout brown; legs and feet verona brown, wood brown, pale drab, tilleul buff, avellaneous, or ecru drab, webs of toes hair brown, natal brown, drab, broccoli brown, or buffy brown; claws black becoming dull dark brown at tips. *First winter (light—normal—phase)*: Acquired by partial postjuvinal molt. Similar to juvenal, but upper surface rather darker, with spots of buff. Bill dark brown, base dull flesh color; feet dark brown or dull flesh color. *First winter (dark phase)*: Similar to light phase, but very much darker; tail plain blackish brown, with only a few light markings; back and scapulars broadly margined and tipped with dull white or buff. *Juvenal (light phase)*: Acquired by complete postnatal molt. Upper parts white, pileum finely, remainder of upper parts broadly, streaked or spotted with hair brown or fuscous, these markings largest on back; wings similar, but with scapulars and center of back much tinged with pinkish buff or cinnamon buff; primaries and secondaries fuscous black or chaetura black, innermost primaries and secondaries neutral gray on inner webs, at least basally, and broadly tipped with grayish white; lower parts white, much mottled with hair brown or drab on breast, jugulum, and sides, faintly so on throat, tail with broad white or very pale grayish base, broad tip chaetura black, mottled with dull white or buffy white terminally. Basal half or two-thirds of bill vinaceous buff, brick red, tilleul buff, cream buff, pale pinkish buff, or pinkish white, terminal part dull black or olive brown, and tip dull white or flesh color; gape pale orange-yellow, pinkish buff, cream buff, or maize yellow; eye-ring black; iris straw yellow, wood brown, auburn, prout brown, or brownish black; legs and feet broccoli brown, mars brown, pinkish buff, tilleul buff, pale ochraceous buff, or vinaceous buff; claws black, tipped with dull white. *Juvenal (dark phase)*: Similar to juvenal in light phase, but very much darker and more blackish.

MEASUREMENTS: *Adult male*: Wing, 365.0–389.1 (average, 378.2) mm.; tail, 143.0–161.0 (150.9); bill (exposed culmen), 41.9–45.5 (44.2); height of bill at base, 15.5–18.0 (16.3); tarsus, 54.1–61.0 (56.4); middle toe without claw, 41.4–42.9 (42.4). *Adult female*: Wing, 334.0–372.1 (362.2); tail, 132.1–150.1 (141.7); bill, 37.1–41.4 (39.6); height of bill, 12.4–14.7 (13.5); tarsus, 47.0–54.1 (50.8); middle toe, 37.1–41.9 (39.4).

TEXAS: *Winter*: Taken northwest to Wilbarger (ca. 1907) and Wichita, east to Galveston, south to Cameron cos.

LAUGHING GULL, *Larus atricilla* Linnaeus

SPECIES ACCOUNT

A rather small gull. *Nuptial adult*: white with dark gray mantle; solid blackish wing-tips and narrow white border along trailing edge of wing (inconspicuous on outer primaries); blackish head with incomplete white eye-ring; maroon bill, legs. Faintly tinged below with pink. *Winter adult*: whitish head with brownish gray mottling on occiput and about eye. *Immature*: uniform

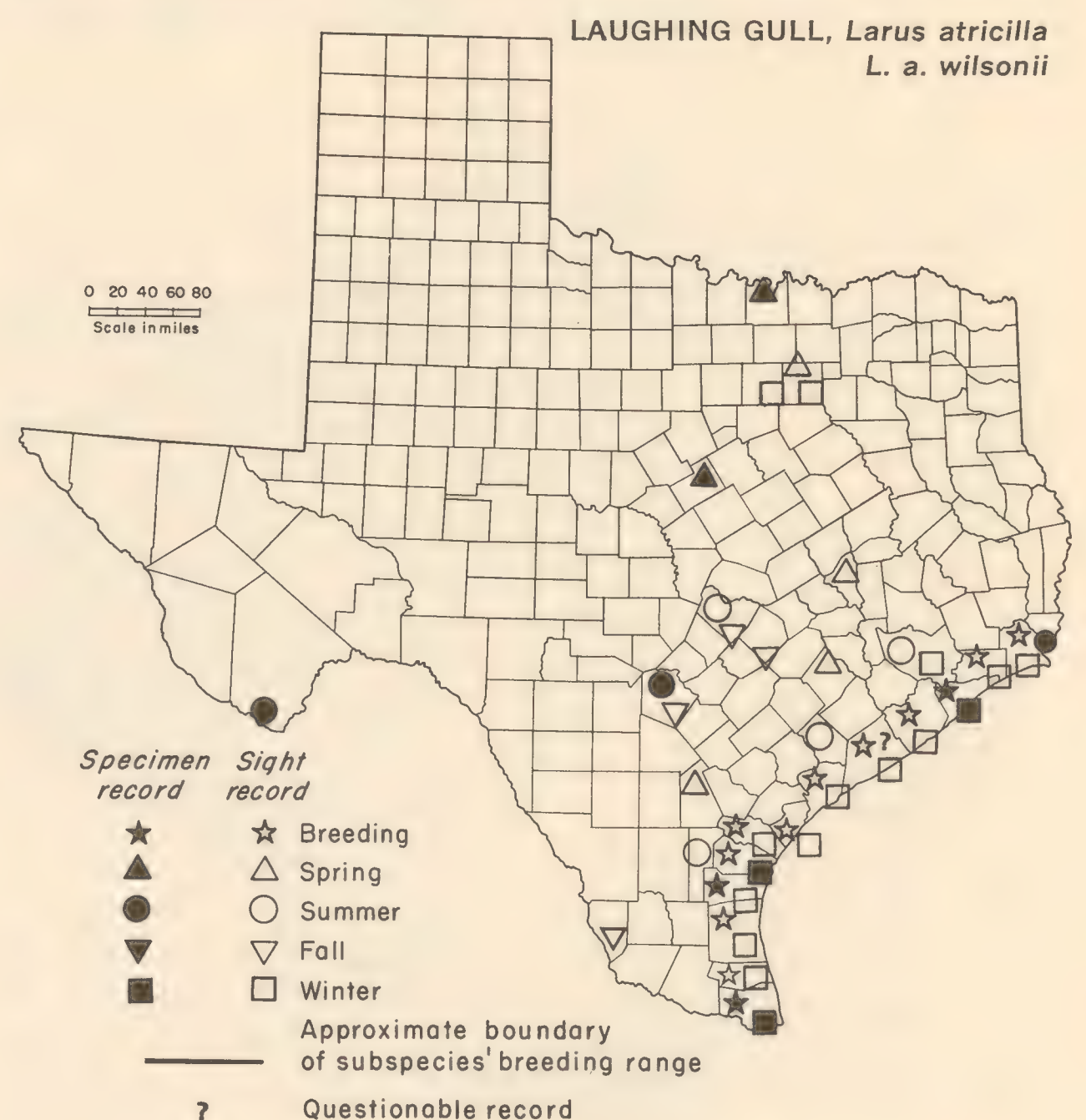
dark brown above (including forehead) with whitish rump and upper tail; broad black subterminal tail-band; brown breast; blackish bill, legs. Length, 16¾ in.; wingspan, 3½ ft.; weight, 8¾ oz.

RANGE: Rather locally along Atlantic North America from Nova Scotia to Yucatán; also coastally through West Indies to Venezuela; locally in interior s. California (irregularly) and along Pacific in Sonora and Sinaloa. Winters mainly coastally from North Carolina to Brazil and from Mexico to n. Peru.

TEXAS: (See map.) *Resident*: Breeds, early Apr. to late July (eggs, Apr. 8 to July 7; dependent young to July 29) just above sea level. Abundant to fairly common along Gulf coast, nesting locally. *Vagrant*: Migrates and wanders inland irregularly through eastern half, where rare to casual; accidental at Big Bend (see detailed account).

HAUNTS AND HABITS: *Hah-ha-ha-ha-haah-hah's* of the Laughing Gull are heard on warm-water coasts of the western Atlantic and on shores of the Gulf of Mexico and Caribbean, where it is the only breeding gull. In Texas, the species is found year-round on Gulf beaches, bay shores, and about salt marshes; sometimes an individual penetrates—usually only a few miles—inland, particularly after rains, where it feeds on earthworms in fields and pastures and on prairies. Frequently this bird gathers into rather large but scattered flocks, which in the cooler months usually include Herring, Ring-billed, and occasionally other gulls.

Flight is light but strong and often long sustained. Laughings stream from their roosts on sunny days in the early morning to feeding grounds, and return, flying low on the horizon, just prior to sunset. On mud flats, the birds feed on crabs; over the Gulf—unable to dive—they pick up small fish, shrimp, and other marine life from the water's surface. Noisy flocks trail shrimpers and fishing boats to scavenge discarded



scraps and refuse. Campers and other beach visitors attract hordes of these and other gulls by tossing pieces of bread or other food into the air where the low-swooping birds catch the handouts in their bills. Close observers note that Laughing Gulls will often drop and abandon unbuttered bread. However, they almost invariably quickly gulp down greasy fried potatoes and shrimp, thus illustrating that this species, like many other seabirds, craves fat and animal oils. The Laughing walks frequently and with ease on beaches and swims buoyantly, often with head raised and tail cocked.

This bird's long, drawn-out laugh is often delivered from a perch on a building or piling, but its brisk *ka-ha* usually sounds as it flies along. Since the Laughing is the only gull which nests in Texas, it tends to be noisier than those species which only winter here. Even Laughings, however, quiet down a bit in cold weather.

CHANGES: As yet there have been no drastic changes in the status of the Laughing Gull in Texas. However, with continued poisoning of the Gulf coast, the species is likely to suffer in years to come. In May and June, 1969, the Cooperative Fish-eating Bird Survey found 3,803 Laughing Gulls on the upper coast, 14,800 on the central coast, and 1,850 on the lower coast. It will be interesting to compare these figures with those of future censuses.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN LAUGHING GULL, *Larus atricilla wilsonii* (Boie)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Head, chin, throat, and anterior part of hind-neck deep mouse gray, becoming dark mouse gray on posterior portion; narrow short white line below and another above eye posteriorly; lower neck, upper tail-coverts, tail, and remainder of lower surface white, in life often with delicate pinkish tinge; mantle and rump neutral gray; five outer primaries with most of terminal portion dull black or chaetura black, decreasing on inner feathers to narrow black subterminal area; all secondaries tipped with white, primaries narrowly so, but outermost primary not at all. Bill maroon or dark brownish red, terminally dragon blood red, blood red, or carmine, and with distinct brown bar or spot subterminally; corner and interior of mouth deep carmine or vermilion; eyelids posteriorly white, their edges vermilion; iris burnt umber or dark grayish brown; legs and feet bay or dark reddish brown, but webs of toes black and bay; claws black or slate black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head and upper neck white, feathers about eye and on occiput and auriculars spotted or flecked with hair brown. *Second nuptial:* Acquired by partial prenuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Similar to adults in winter, but tail with partial or obscurely indicated black subterminal bar. *First nuptial:* Acquired by partial prenuptial molt. Similar to adults in winter, but hindneck and sides of neck flecked with hair brown or dull gray; tail with broad subterminal band of fuscous black or fuscous; wings as in first winter. Bill black, brownish black, or olivaceous black, tinged with red, and tipped with dull white; inside of mouth seashell pink or dull orange buff; eye-ring black; iris brownish black; legs, feet, and claws black. *First winter:* Acquired by partial postjuvenile molt. Similar to juvenal, but entire plumage much more grayish; edgings of upper parts narrower and more whitish, and with ad-

mixture of gray feathers; anterior lower parts more extensively whitish, usually less buffy. *Juvenal:* Acquired by complete post-natal molt. Upper parts light hair brown or dark drab, feathers edged with dull pale buff, and those on wing-coverts, scapulars, and back broadly with cinnamon buff or pinkish buff; rump pale brownish neutral gray; upper tail-coverts white; tail dull grayish white or very pale gray at base, terminal portion fuscous black or chaetura black, tipped with dull white or buffy white; wing-quills chaetura black, inner primaries tipped with white or brownish white, secondaries broadly tipped with white and edged with grayish white on inner webs, becoming almost white basally; sides of head and of neck like upper parts; feathers of jugulum often margined with cinnamon buff, posterior lower parts white or buffy white, mottled on sides and flanks with drab and pale cinnamon buff. Bill dull brown; legs and feet olive. *Natal:* Upper parts wood brown, drab, or light buffy gray, confusedly much mottled with dull black or clove brown; lower parts wood brown, cartridge buff, or cream buff anteriorly, posteriorly dull tawny ochraceous or drab; middle of abdomen pale cinnamon buff or cream buff, throat spotted with clove brown. Bill dull light brown; legs and feet dull dark brown.

MEASUREMENTS: *Adult male:* Wing, 304.0–336.0 (average, 322.1) mm.; tail, 120.9–135.1 (127.8); bill (exposed culmen), 39.9–42.9 (40.9); height of bill at base, 12.4–14.5 (13.5); tarsus, 45.0–53.1 (50.3); middle toe without claw, 34.5–38.1 (36.1). *Adult female:* Wing, 301.0–329.9 (313.7); tail, 116.1–125.5 (120.1); bill, 38.1–41.9 (39.4); height of bill, 10.9–13.5 (12.2); tarsus, 44.4–51.6 (48.3); middle toe, 32.5–35.1 (33.5).

RANGE: On coasts and coastal islands from Nova Scotia to Florida and Texas; locally in s. California (Salton Sea) and on coasts of Sonora and Sinaloa. Winters coastally from North Carolina to s. Texas and Panama, and from Sinaloa to Guatemala and Colombia; also Bahamas and Puerto Rico (casually).

TEXAS: *Resident:* Collected along coast northeast to Jefferson, southwest to Cameron cos. *Vagrant:* Collected inland in Cooke (2 on Apr. 10), Hamilton (Apr. 26), and Bexar (Aug. 4) cos. One specimen from Brewster Co., Black Gap (June, 1951, W. T. Thompson).

NESTING: *Nest:* In colonies; on islands along seacoast, in wet marshy areas, on dry sand dunes, or in meadows; on wet or dry ground, usually in tussock of grass, under or in clump of bushes; cup, often well-built, and usually well-concealed; made of grass, sticks, seaweeds, and rubbish; well lined with grasses, pieces of twigs, and rubbish. *Eggs:* 2–5, usually 3; elliptical ovate or ovate to short ovate; cream buff, olive buff, pea green, or bluish white; blotched, scrawled, and spotted with sayal brown to raw umber, with shell markings of pale gray or dull lavender; average size, 53.6 × 38.6 mm.

FRANKLIN'S GULL, *Larus pipixcan* Wagler

SPECIES ACCOUNT

Adult: closely resembles larger Laughing Gull, but wing-tip white, crossed centrally by irregular broad black band; from below, inner white patch ("window") in wing-tip noticeably translucent; bill slenderer. Nuptial bird is conspicuously tinged below with pink. *Immature:* resembles young Laughing, but forehead and breast whitish. Length, 14¾ in.; wingspan, 3 ft.; weight, 9½ oz.

RANGE: Prairies of s. Canada, south to s.e. Oregon, Great Salt Lake region, n.e. South Dakota, and n.w. Iowa. Winters along Pacific chiefly from Peru to c. Chile; north sparingly and irregularly to Pacific Guatemala, casually to Gulf coastal Texas.

TEXAS: (See map.) *Migration:* Early Apr. to early

June; late Sept. to late Nov. (extremes: mid-Mar., June 29; mid-July, Jan. 18). Abundant (migrates in large flocks) to fairly common through eastern three-quarters; uncommon to rare through western Panhandle and Trans-Pecos. *Winter*: Mid-Jan. to mid-Mar. Overwinters casually along coast. Individuals occurring inland from Dec. well into Jan. most likely fall stragglers; Feb. records from interior lacking.

HAUNTS AND HABITS: The Franklin's Gull is the "prairie pigeon" of the interior northern United States and southern Canada; as a species it takes first place among gulls as a long-distance migrant. It breeds in large, compact colonies in reedy marshes bordering lakes. The nest, which varies greatly in size and construction, is most commonly a dry, well-made cup floating on a mass of old stalks amid bulrushes growing in one to six feet of water. Breeding wetlands are harmoniously shared with many other birds, especially the Eared Grebe; also Redhead, Canvasback, Ruddy, and other ducks, terns, and blackbirds. In fall, flocks fly to suitable winter feeding quarters which are chiefly near the western coast of South America.

Seen flying over or resting upon the plains of Texas, migrating Franklin's Gulls, often in huge compact groups, are especially beautiful in spring when their black heads are neat and their breasts are blushing rose. The blush occasionally takes on a lurid hue when breasts of nighttime migrants reflect neon glare from cities; during the flying saucer craze of the 1950's and '60's, explorer Sir John Franklin's Gull was the source of quite a few unidentified flying object reports.

The present species is, however, chiefly a day migrant. It is of interest that normally *Larus pipixcan* is mostly a land bird by day during warm seasons and a water bird by night and during winter. Migrant

Franklin's Gulls, by the hundreds, have been observed roosting while afloat on Lake Travis, near Austin, Texas, also in the Pacific off Peru. The Franklin's is, in fact, very much a bird of the eastern Pacific during the Northern Hemisphere winter. In March and April, flocks fly north along the Pacific coast of South and Central America; at Mexico's skinny waist, the Isthmus of Tehuantepec, they cross over to the Gulf of Mexico drainage where most individuals carry on their activities until the eve of the following winter.

Flight, buoyant and easy, is steady and fairly rapid when the bird is flying any distance; foraging Franklin's Gulls hawk over prairie and field like large swallows. A great asset to agriculture, they devour quantities of grasshoppers and locusts in addition to dragonflies (nymphs are a chief food regurgitated for nestlings), mosquitoes, gnats, flies, and other insects and their larvae; the birds also feed on snails, other mollusks, crayfish, lizards, frogs, and small fish. Like other Larinae, this gull frequently descends to the ground, and seems perfectly at home whether on grassy or plowed earth. On water it swims lightly and with ease, at times with its tail elevated.

A common call of the Franklin's is described by A. C. Bent as a soft *krrruk*; birds also utter many clucking and mewing notes. On bright summer days, as they soar high in the blue sky, these gulls cry shrill, clear mournful *week-a week-a week-a's, po-lee po-lee po-lee's*, etc. The latter notes sound fairly frequently in spring as circling flocks drift northward over Texas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Top and sides of head and upper hindneck blackish neutral gray; chin and throat dark neutral gray; lower hindneck, upper tail-coverts, lining of wing, and remainder of lower parts white, in life white neck and lower surface somewhat tinged with eosine pink which fades in museum specimens; long spot just above eye and another just below eye white; tail mostly white or grayish white, but middle feathers pale neutral gray or pallid neutral gray, and always gray at base; back, rump, and wings neutral gray; tertials, secondaries, and all primaries broadly tipped with white, outer web of first primary, except at tip, and a subterminal spot on outermost five primaries dull black (and the amount of black variable), these spots largest on second and third primaries, sometimes also on first, and smallest on fifth, but, on last, confined to inner web, and just above these black spots another white area. Bill maroon or deep red, with distinctly darker band near tip; eyelids dragon blood red; lining of mouth deep carmine; iris burnt umber; legs and feet burnt sienna or dull red; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but most of head and neck white, only back, sometimes top of head, and orbital and auricular regions fuscous or hair brown. Bill, legs, and feet dark brown, bill tipped with reddish orange or light brown. *Second nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but black on terminal portion of primaries of less extent, white area larger. Bill claret brown, but tip dragon blood red; inside of mouth scarlet; tongue rufous; eye-ring brick red tinged with orange; iris prout brown; legs and feet bay; claws black. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter, but black on two outer primaries of greater extent, white subterminal portions usually much less. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults, but top and sides of head and upper hindneck darker and more blackish; wings similar to those of nuptial adults, but black at tips of primaries

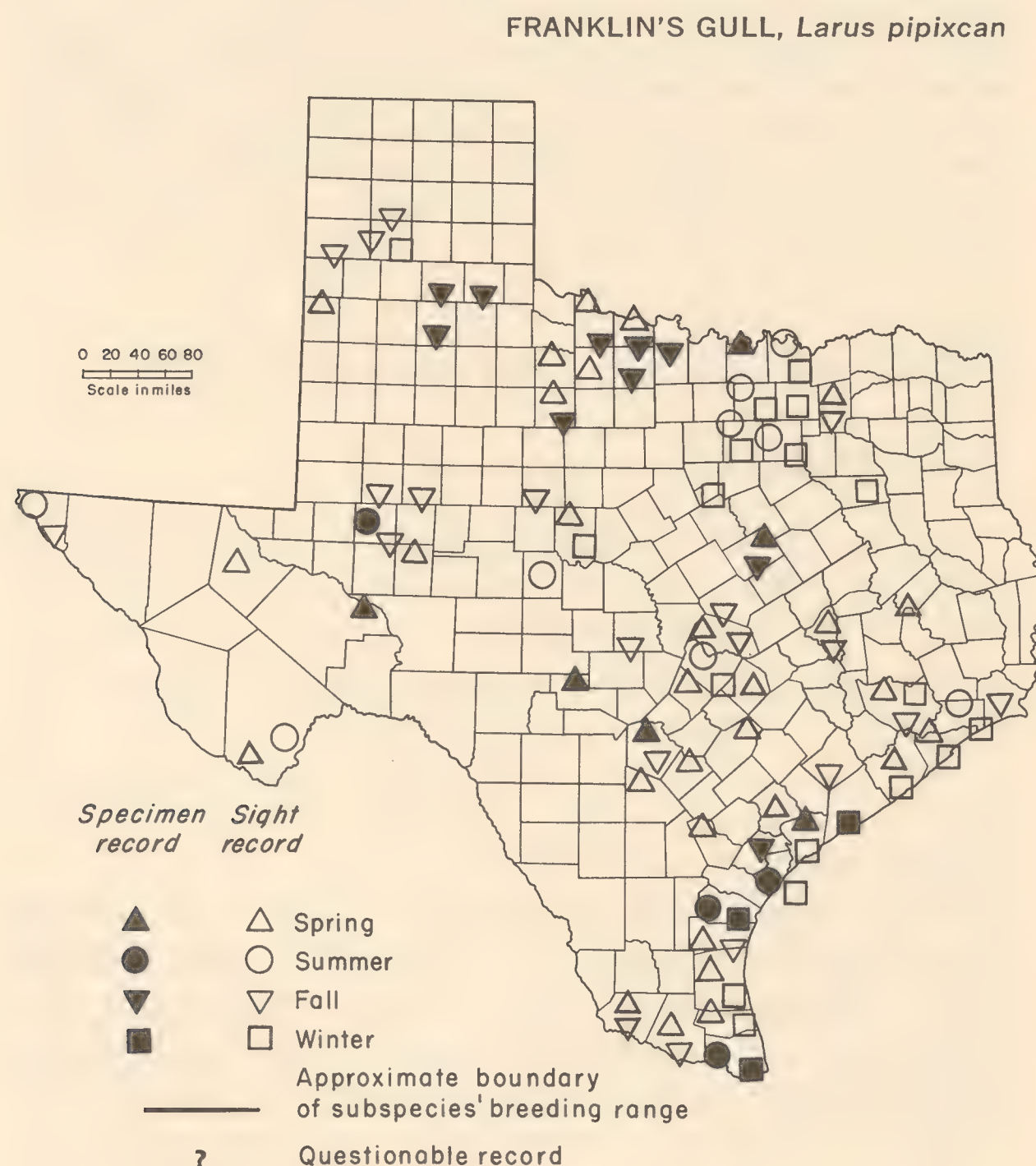




PLATE 13: Common Nighthawk, *Chordeiles minor*

much more extended, outer primary mostly black, with broad whitish wedge on basal part of inner web. Bill and legs with traces of dark red. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but hindneck and throat much spotted with hair brown or fuscous; scapulars somewhat mixed with fuscous; wings and tail as in juvenal. *Juvenal*: Acquired by complete postnatal molt. Head, neck, back, and scapulars hair brown or dull drab, feathers edged with wood brown or dull buff; rump dull light neutral gray; upper tail-coverts white; tail white, middle feathers very pale neutral gray or dull white with broad subterminal band of chaetura drab; primaries and secondaries chaetura black or chaetura drab; paler on inner webs, secondaries broadly tipped with white, and inner primaries and most of secondaries edged with dull neutral gray on outer webs; sides of head hair brown; spot on posterior portion of each eyelid white; sides of neck white, spotted or mottled with hair brown, as are sides of breast; remainder of lower surface white. Bill dull black or dark seal brown, tip paler; iris brownish black; legs and feet chaetura black or pale drab; claws slate black.

MEASUREMENTS: *Adult male*: Wing, 279.9–294.9 (average, 289.8) mm.; tail, 97.1–109.0 (103.9); bill (exposed culmen), 29.9–34.0 (32.8); height of bill at base, 9.4–10.9 (10.2); tarsus, 38.1–42.4 (40.6); middle toe without claw, 31.5–33.0 (32.3). *Adult female*: Wing, 270.0–293.1 (281.9); tail, 94.0–104.9 (99.8); bill, 29.9–34.5 (32.5); height of bill, 9.4–10.9 (10.2); tarsus, 39.1–40.9 (39.6); middle toe, 31.5–34.0 (32.3).

TEXAS: *Migration*: Collected north to Briscoe and Hall, east to Cooke and Matagorda (Dec. 1), south to Cameron, west to Pecos cos. *Winter*: Two specimens: Nueces Co., Corpus Christi (Feb. 13, 1930, J. C. Braly); Cameron Co. (Jan. 22, 1892, F. B. Armstrong).

BONAPARTE'S GULL, *Microlarus philadelphia* (Ord)

SPECIES ACCOUNT

Larus philadelphia of A.O.U. check-list, 1957 (see Appendix A). A small, ternlike gull with flashy white triangular patch in black-tipped primaries. *Nuptial adult*: blackish head with incomplete white eye-ring; gray mantle; white body, tail; small black bill; red legs. *Winter adult*: whitish head with prominent blackish postocular spot; paler legs. *Immature*: resembles winter adult, but with more black in outer primaries and narrow black subterminal tail-band; brown-tipped secondaries form longitudinal wing-band. Length, 13¾ in.; wingspan, 32; weight, 7 oz.

RANGE: Interior regions of Alaska and w. Canada. Winters along Pacific from s. British Columbia to c. Mexico and along Atlantic from New England to Yucatán; also West Indies; some winter on inland lakes from Canada-U.S. border to c. Mexico.

TEXAS: (See map.) *Winter*: Early Oct. to late Apr. (extremes: Aug. 2, early June). Common to uncommon along Gulf coast; uncommon (occasionally fairly common locally) to rare inland; largely absent in desert areas.

HAUNTS AND HABITS: The plump, rather dove-bodied Bonaparte's Gull, smallest of common North American gulls, breeds near Canadian lakes and marshes in very loose colonies. Quite ungull-like, it nests in trees, selecting usually a spruce or fir, where, low or high (up to 20 feet), it builds its moss-lichen-grass nest on a horizontal branch. In the nonbreeding season, the bird's wanderings are unpredictable; in Texas, most

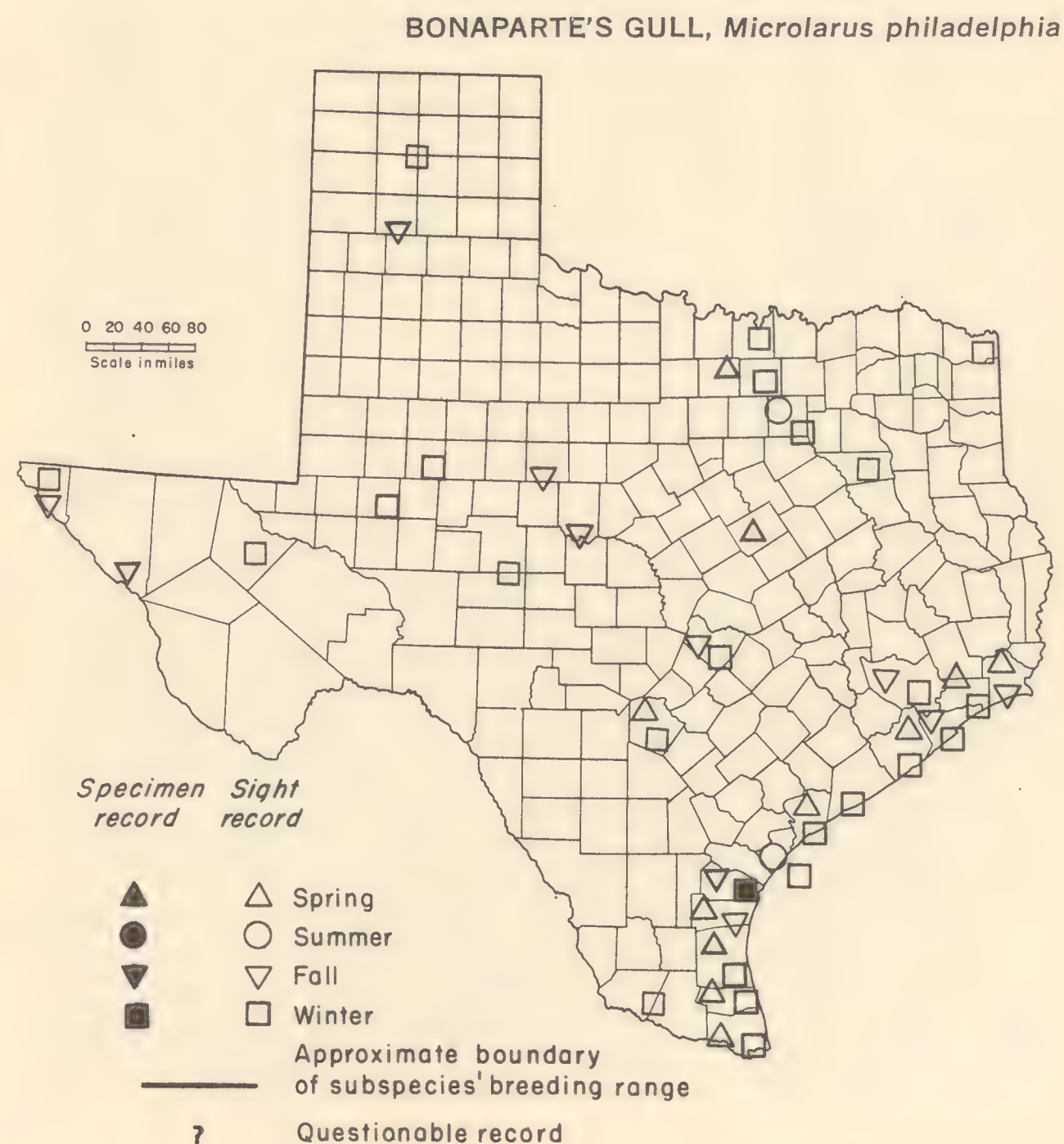
individuals winter irregularly on islands and about salt marshes of the Gulf coast, while some spend the colder months on inland lakes and impoundments. Gatherings of Bonaparte's Gulls can be large where the birds are numerous, but are almost always somewhat scattered.

Flight—more tern- than gull-like—is very light, airy, strong, and often long sustained; in mid-air the Bonaparte's has the habit of pointing its bill downward, making it appear even more like a tern. When feeding over water, a group of these gulls looks like a gathering of huge butterflies as individuals flutter near the surface to pick up food; occasionally some settle to float on the surface. The bird's diet depends on season and locale: In the breeding months, also when migrating inland, it consumes a quantity of grasshoppers, beetles, locusts, ants, bees, and other insects, which it catches on the wing, behind the farmer's plow, or on the ground about lakes or ponds; in coastal situations during winter, the gull feeds on small fish, crustaceans, snails, and marine worms. On the ground, it walks about easily as do other members of its family; it swims gracefully and rises from the water as lightly as it descends.

Rather weak voiced for a gull, the Bonaparte's common cry is a nasal *cheer* or *cherr*; it also utters faint whistled notes while feeding. The latter is the chief vocalization heard in Texas.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head, upper hindneck, chin, and throat dark mouse gray, but with elongated spot of white on each eyelid; lower part of hindneck, upper tail-coverts, tail, lining of wing, and entire lower parts white; in life foreneck and under parts usually somewhat tinged with eosine pink which fades in mu-



seum specimens; back, rump, scapulars, secondaries, superior wing-coverts, and inner webs of primaries pale neutral gray; outer web of outermost primary gray, all with a terminal area of fuscous black or dull black, and all but two outermost narrowly tipped with white, inner feathers with pale neutral gray; remaining portions of two outer primaries white, third and fourth white on outer webs, pale neutral gray on inner webs. Bill black; bare orbital ring black; interior of mouth orange-red, coral red, strawberry pink, jasper red, or light jasper red; iris vandyke brown or bay; legs and feet orange-red, vinaceous buff, apricot buff, salmon buff, strawberry pink, salmon color, or pale salmon color, but sometimes legs in front, together with toes, flesh pink; webs of toes between bittersweet pink and grenadine pink; sometimes cream buff; lower tibia and upper part of tarsus on outside strawberry pink; claws chaetura black, light seal brown, brownish black, or black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but head, neck, chin, and throat white, except for tinge of gray on occiput and hind-neck; spot on auriculars slate gray, another small spot of same color in front of eye; legs and feet paler than in nuptial adults. Bill black or olivaceous black, but base of mandible and basal part of cutting edges of maxilla mahogany red to brownish sienna or pompeian red; eye-ring black; inside of mouth nopal red, rose doree, peach red, or light jasper red; iris auburn, bay, or vandyke brown; legs and feet pinkish cream color, peach red, salmon buff, light salmon orange, orange pink, pinkish white, rufous, or flesh ocher; claws brownish black, snuff brown, bone brown, benzo brown, hair brown, or black. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but sometimes with slight subterminal markings of black on tail feathers; black shaft streaks on some of primary coverts. Maxilla dark olivaceous black, terminally black; mandible light brownish drab or russet to black, terminally black; inside of mouth coral red or light coral red; eye-ring black; iris bay or chestnut brown; legs and feet seashell pink or venetian pink, but webs of toes pinkish white; claws natal brown, verona brown, brownish black, or avellaneous. *Second winter*: Acquired by complete postnuptial molt. Similar to adults in winter, but tail with some subterminal markings of dull black; some primary coverts with black shaft streaks. *First nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults, but head and neck only partially dark gray, feathers usually much mixed with white; tail with broad fuscous or fuscous black subterminal band; wings much as in juvenal. Bill and eye-ring black; inside of mouth rose doree or peach red; rictus light orange-yellow; iris argus brown; legs and feet pale brownish drab, vinaceous buff, vinaceous fawn, or salmon buff, but webs between toes sometimes tilleul buff or avellaneous; claws bone brown, seal brown, or black. *First winter*: Acquired by partial postjuvinal molt. Similar to adults in winter, but wings and tail as in juvenal. *Juvenal*: Acquired by complete postnatal molt. Forehead white or buffy white; remainder of upper parts hair brown or dark drab, feathers edged with pale buff or cinnamon buff, most broadly on back and scapulars; rump rather brownish pale neutral gray; tail white with broad subterminal band of fuscous or fuscous black; outermost primaries white, outer webs and shafts, with terminal portion of all primaries, fuscous black or chaetura black; remainder of primaries pallid neutral gray or pale neutral gray, blackish subterminal portion tipped with same; secondaries mostly pale neutral gray or pallid neutral gray with broad fuscous or hair brown tips, these decreasing to subterminal shaft spots on innermost, and all with pallid neutral gray tips; wing-coverts pallid neutral gray, anterior lesser coverts fuscous or hair brown, together with tertials and remainder of lesser coverts, tipped with pale buff; sides of head white, auricular region with spot of hair brown, and another in front of eye; sides of neck like hindneck; lower parts, including lining of wing, white. Bill brownish black, olivaceous black, or black, but base of maxilla dark olive brown, that of mandible sometimes light cinnamon drab or vinaceous buff; inside of mouth pinkish buff or salmon color or light coral red; rictus seashell pink; iris brownish black, seal brown, or warm sepia; eye-ring black; legs and feet pale vinaceous buff, venetian pink, light grayish vinaceous, pale brownish drab, or

light flesh color; but webs between toes white or buffy white; claws black or slate black, sometimes white at tips.

MEASUREMENTS: *Adult male*: Wing, 254.0–268.0 (average, 260.6) mm.; tail, 96.0–108.5 (101.1); bill (exposed culmen), 27.9–33.0 (31.2); height of bill at base, 8.1–9.4 (8.6); tarsus, 32.0–36.1 (33.8); middle toe without claw, 27.9–32.0 (30.2). *Adult female*: Wing, 247.1–265.9 (256.0); tail, 95.0–106.4 (99.8); bill, 28.4–32.0 (30.2); height of bill, 7.4–8.9 (8.4); tarsus, 33.0–35.6 (34.0); middle toe, 28.4–32.0 (30.5).

TEXAS: *Winter*: Taken in Nueces Co. (8 specimens).

LITTLE GULL, *Hydrocoloeus minutus* (Pallas)

SPECIES ACCOUNT

Larus minutus of A.O.U. check-list, 1957 (see Appendix A). A very small, ternlike gull with short, rounded wings. *Nuptial adult*: white with pearl mantle; black head; blackish underwing surface contrasting with white-tipped flight feathers and white body; short, slender dark red bill. *Winter adult*: mainly white head with blackish postocular spot and hind-head patch; blackish bill. *Immature*: similar to winter adult, but has paler underwings; dark brown bar on hind-neck; brownish barring across back; zigzag wing pattern similar to young Kittiwake's; very narrow blackish terminal tail-band. Length, 11 in.; wingspan, 24.

RANGE: N. Eurasia; also rarely in s.e. Ontario. Winters south to s. Eurasia and n. Africa; European stragglers winter in s.e. Canada and n.e. United States, south to Great Lakes and New Jersey; casual elsewhere in United States.

TEXAS: *Winter*: Dec. 20 to May 20. Casual straggler to eastern half.

HAUNTS AND HABITS: The Little Gull, smallest of the Larinae, is a native Eurasian. Only very occasionally does this bird stray to the western Atlantic seaboard where it mingles with Ring-billed and Bonaparte's gulls and Common Terns; these vagrants generally go unnoticed except in localities where the bird watcher population is high. Speculations that the species is a regular nester in North America need more substantiation, although in 1962, three Little Gull nests, each with three brownish eggs, were found in a Lake Ontario marsh. From Holland through Sweden to Siberia, this gull breeds on inland marshes and about marshy lakes; the nest is built in colonies upon a grassy knoll or floating mass of dead, tangled vegetation. Quite migratory, Little Gulls move southwestward each fall to wintering grounds as far south as the coasts of northern Africa.

Like terns in flight, manner, and fishing techniques, the graceful and active Little Gull is distinguished from them by its short, rounded wings. In coastal situations, it hovers to pick up small fish and crustaceans at the surface; sometimes it even dives from the air to secure its prey. While inland, it takes insects on the wing. Migrants in groups of considerable size fly low and swift across seas, frequently dropping to pick up food as they go.

Little Gull vocalizations have been described as

kek-kek-kek and a higher pitched, harsh *ka-ka-ka*. The individual found at the Webberville sewage ponds, Austin, Texas, was apparently silent (see detailed account).

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Probably never seen in Texas. Acquired by partial prenuptial molt. (See Ridgway, 1919, *Bull. U.S. Nat. Mus.*, no. 50, pt. 8, p. 649.) *Adults, winter:* Acquired by complete postnuptial molt. Resembling nuptial adults, but head and neck white; hind-head tinged with gray; auriculars with gray spot. Legs and feet paler, even flesh color. *First nuptial:* Acquired by partial prenuptial molt. Sides of head and neck, upper tail-coverts, lower surface, and tail white; spot on auriculars dark gray; crown to upper back dull brown, lower back feathers tipped with buff; upper surface of wings and rump mostly light gray; tail with black band near tip; much of tips of outermost several primaries mostly black; lining of wings light grayish. Bill dull brown; legs and feet pale brown. *First winter:* Acquired by partial postjuvenile molt. Upper parts mostly dark brown, feathers with buff or white tips; wing-coverts tipped with white; secondaries and inner webs of outer primaries mostly white, but black in spread wings shows as bar on forewing from tips of primaries to inner secondaries; tail with black terminal band. Bill dark brown; feet yellow to flesh color. *Juvenal:* Acquired by complete postnatal molt. Upper parts, including wings, mostly blackish brown; white space on proximal part of wings; dark brown band on tail near tip.

TEXAS: *Winter:* One specimen: Dallas Co., Trinity River Authority central sewage system ponds (second-year bird essentially in winter plumage, Apr. 3, 1965, Patsy McGuire, Hazel B. Nichols, Marcia Pulich, W. M. Pulich, collector; identification confirmed by L. W. Oring and G. M. Sutton; University of Dallas collection). One observation substantiated with color photographs by Winifred Simon: Travis Co., Webberville wastewater treatment ponds (immature, Dec. 20–27, 1969, V. L. Emanuel, E. B. Kincaid, Jr., J. L. Rowlett, Rose Ann Rowlett, D. Simon, J. A. Tucker, F. S. Webster, Jr., et al.).

BLACK-LEGGED KITTIWAKE, *Rissa tridactyla* (Linnaeus)

SPECIES ACCOUNT

A rather small gull with long, trim wings. *Nuptial adult:* white with gray mantle; wings with sharply defined black tips; unmarked, mainly pale yellow bill; broad, almost square tail; black legs. *Winter adult:* similar but with grayish crown and nape. *Immature:* blackish bill, postocular spot, and nuchal bar; blackish outer primaries (with a few whitish spots) and blackish longitudinal wing-band form elongated M as bird flies away; black terminal band on slightly notched tail. Length, 17 in.; wingspan, 3 ft.

RANGE: Circumboreal in arctic and subarctic regions. Largely pelagic in winter, reaching southern parts of Northern Hemisphere; also coastally from southern limits of breeding range to Pacific Mexico, U.S. Gulf coast (casually), Bermuda, Mediterranean region, and Japan; casually on interior lakes.

TEXAS: *Winter:* Nov. 11 to Mar. 31. Casual visitor to upper coast and inland lakes. Only one specimen; however, immature bird photographed: Starr Co., Falcon Reservoir (Dec. 29, 1971, by Winifred Simon; published in black-and-white in *American Birds* 26

[1972]: 445; color print no. 23 in Texas Photo-Record File, Texas A&M University).

HAUNTS AND HABITS: The gentle, but hardy, Black-legged Kittiwake is probably the most abundant of gulls—but not in Texas where its occurrence is decidedly freakish. In arctic and subarctic regions, this truly pelagic, salt-water-drinking species seeks high, rugged cliffs—typically facing stormy seas—for nesting. Here in large colonies, often with auks and guillemots, the birds secure seaweed-and-moss cups to ledges and rocky outcrops in which to lay their eggs. In the nonbreeding season, flocks of Kittiwakes move over oceans of the Northern Hemisphere (off the U.S. Atlantic coast rarely south of New Jersey). Since these birds typically avoid land, observers usually must go to offshore fishing shoals to view them.

With rapid, shallow wing-beats, the long-winged, broad-tailed Kittiwake moves swiftly with ease and grace. It often soars in circles but hovers closer to the water's surface when feeding and, like a northern tern, plunges for small fish and plankton that drift with ocean currents. It is said to be the only gull able to dive from the surface and swim underwater in pursuit of prey. Sometimes it picks up floating morsels without settling on the water, as do many tropical terns.

The soft, mellow *kit-ti-wake's*, for which this gull is named, sound most commonly about the nesting cliffs. Disturbed birds or individuals in an excited feeding flock rattle loud piercing *ki, ki, ki's, kaa, kaa, kaa's*, and other similar harsh noises. Vagrants in southern locales are usually quiet.

DETAILED ACCOUNT: ONE SUBSPECIES

ATLANTIC BLACK-LEGGED KITTIWAKE, *Rissa tridactyla tridactyla* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Probably never seen in Texas. Acquired by partial prenuptial molt. (See Ridgway, 1919, *Bull. U.S. Nat. Mus.*, n. 50, pt. 8, pp. 565–566.) *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but occiput, hindneck, sides of neck, and upper back washed with light to pale neutral gray, also spot in front of eye and on auriculars deep neutral gray, which sometimes extends as collar across occiput. *Second nuptial:* Acquired by partial prenuptial molt. Like nuptial adults, but outer primary coverts with some black markings; head a little washed with gray. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter, but outer primary coverts with a few black or dark brown markings. *First nuptial:* Acquired by partial prenuptial molt. Similar to first winter, but occiput and hindneck neutral gray to light neutral gray with only a few dark spots or none, these brown instead of black, thus large black collar absent; dark areas of wings lighter, brown instead of black or brownish black. Bill greenish yellow instead of black. *First winter:* Acquired by partial postjuvenile molt. Head white, in places washed with pale neutral gray; spot in front of eye and on auriculars deep neutral gray; hindneck pale neutral gray with large crescentic collar of black-tipped feathers; back, rump, and scapulars neutral gray to pale neutral gray; upper tail-coverts and tail white, latter more emarginate than in adults and broadly tipped, except on outermost feather, with black; outer primaries dark fuscous black, broad inner edge, except at tip, white; inner primaries nearly all white with black subterminal bar, fifth and sixth (from outermost) with white tips; secondaries pallid neutral gray, terminally white; tertials light neutral gray to white; primary coverts fuscous, inner feathers broadly

margined with pallid neutral gray; median and greater wing-coverts light to pale neutral gray, most of lesser coverts in part or wholly fuscous, tertials also striped with fuscous, these dark markings forming broad gray mottled stripe along inner edge of closed wing; lining of wing and entire lower surface white. Bill black. *Juvenal*: Acquired by complete postnatal molt. Similar to first winter, but head and hindneck more extensively white, with little or no light gray.

RANGE: Locally in arctic and subarctic regions; in North America, on coasts and coastal islands from Devon Island and n. Greenland, south through e. Hudson Strait to Newfoundland. Winters in Northern Hemisphere mainly between lat. 60° N. and 30° N.; in North America, coastally and at sea from Newfoundland to New Jersey, casually to Florida and Texas; casual on interior U.S. lakes.

TEXAS: *Winter*: One specimen: Bexar Co., San Antonio, Woodlawn Lake (immature discovered, Dec. 30, 1956, Elisabeth R. Blount, Mr. and Mrs. Lester Witham, and found dead, Jan. 1, 1957, H. G. Loftin; identification confirmed by G. H. Lowery, Jr., and H. C. Oberholser; Witte Museum collection, San Antonio).

SABINE'S GULL, *Xema sabini* (Sabine)

SPECIES ACCOUNT

A small, ternlike gull, its forked tail and bold wing pattern (white-tipped black outer primaries contrast with large triangular white patch on inner primaries and 1 secondaries) conspicuous in flight. *Nuptial adult*: short, rather slender, yellow-tipped black bill; gray head, mantle; white body, tail; black legs, feet. *Winter adult*: similar but has blackish smudge on back of white head. *Immature*: similar in pattern to winter adult, but forked tail tipped with black; bill blackish. Length, 13¾ in.; wingspan, 33¼; weight, 6¾ oz.

RANGE: Circumpolar in Arctic. Largely pelagic in winter; reported regularly in Pacific chiefly off n.w. South America, and locally in Atlantic.

TEXAS: *Accidental*: One specimen: Nueces Co., Corpus Christi (adult male, Oct. 4, 1889, F. B. Armstrong). Three careful sightings: Nueces Co., Padre Island (Dec. 30, 1951, G. H. Lowery, Jr.); seaward of Galveston Co., on open water between Galveston and 25 mi. out into Gulf (Oct. 25, 1964, H. L. Patten, J. B. Strickling, J. R. Stewart, Linda Snyder, et al.; substantiated by movies and photos); Travis Co., Webberville sewage ponds (immature, Sept. 22, 23, 1969, R. H. Eakens, R. B. Hill, E. A. Kutac, et al.).

HAUNTS AND HABITS: Sabine's Gull of arctic tundra and coast shares with the Swallow-tailed Gull, *Creagrus furcatus*, of Galápagos rocks and sea, a very ternlike feature—a forked tail. Large concentrations of handsome *Xema sabini* frequent Bering Sea shores, but in the nonbreeding season this species becomes largely pelagic; substantial numbers are commonly seen, especially in autumn, migrating well off the shores of California and France. On land in temperate North America—Texas included, of course—the Sabine's is a mere straggler, but one which has been recorded in practically every state. The Sabine's Gull lays usually three sepia-spotted brown eggs on low, marshy ground in a slight depression scantily lined with grass. The bird is

seen singly or in small companies of two or three; nesting colonies are usually small—closer to six nests than to sixty. Sometimes large, but scattered, flocks gather during migration and where food is found.

Flight is graceful, swift, direct, and ternlike; as the bird hawks over water, it is slow and hovering. Apparently the Sabine's, like most gulls, doesn't dive, but instead picks food from the water's surface as it flies along. When the tide is out, this gull feeds on mud flats in the vicinity of its breeding haunts, running about the beach much like a plover. The bird's terrestrial diet consists chiefly of flies, dragonflies, beetles, other insects and their larvae; aquatic food includes marine worms, crustaceans, plankton scum, together with sticklebacks (Gasterosteidae) and other small fish. The Sabine's rests on the water gracefully and lightly, swimming with ease and rising into the air with little effort.

The ordinary call of this gull is a harsh cry similar to that of the Arctic Tern, but shorter and even more grating; it also utters batlike clicking and chipping noises. Migrating Sabine's Gulls are usually quiet.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN SABINE'S GULL, *Xema sabini sabini* (Sabine)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Head, chin, and throat between deep neutral gray and dark quaker drab, bordered posteriorly by narrow collar of black; hindneck, upper tail-coverts, tail, lining of wing, and remainder of lower parts white, the last often somewhat tinged with eosine pink; back, rump, scapulars, tertials, and upper wing-coverts light neutral gray to light mouse gray; outer six primaries dull black, broadly tipped with white, and inner half of inner webs, except at tips, dull white, the sixth white to its tip, rest of primaries and all secondaries, except innermost, white, the innermost gray like back but broadly tipped with white as are greater wing-coverts, outermost of which are nearly all white as are some of largest outermost median coverts. Bill black, but terminal third chrome yellow or orange; eyelids and inside of mouth scarlet, vermilion, or orange; iris chestnut; legs and feet dull greenish black; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but head and neck chiefly white, although occiput, upper hindneck, and auriculars dark gray. Bill black, but terminal third baryta yellow, yellowish white, or apricot yellow; eye-ring black; inside of mouth grenadine orange to salmon orange; legs and feet gull gray, hair brown, fuscous, slate gray, or black, mottled with light gull gray; webs between toes hair brown, fuscous, olive buff, light olive gray, or dark mouse gray; claws black. *Second winter*: Acquired by complete postnuptial molt. Like adults in winter. *First nuptial*: Acquired by partial prenuptial molt. Similar to first winter, but head and throat more or less extensively dark gray as in nuptial adults; also with partial black collar on neck. *First winter*: Acquired by wear from juvenal. Similar to juvenal, but upper parts paler and more grayish, edgings of feathers almost white or buffy white; lower parts entirely pure white. *Juvenal*: Acquired by complete postnatal molt. Forehead dull buff or dull white; pileum hair brown, feathers edged with dull buff or wood brown; remainder of upper surface, including wing-coverts, scapulars, and tertials, hair brown or dark drab, feathers with subterminal bar of fuscous and tip of dull buff, clay color, or tawny olive; tail white with broad terminal band of fuscous or chaetura drab; wing-quills similar to adults but with smaller white tips on outermost primaries; sides of neck like hindneck; remainder of lower surface white, slightly shaded with dull pale buff and gray across throat. Bill dark brown or dull black, base flesh color; legs and feet

flesh color or light gray, somewhat tinged with lavender; iris dark brown.

MEASUREMENTS: *Adult male:* Wing, 264.9–286.0 (average, 277.4) mm.; tail, 114.6–130.0 (122.5); bill (exposed culmen), 25.4–28.4 (27.2); height of bill at base, 8.4–9.9 (9.1); tarsus, 31.5–34.5 (33.3); middle toe without claw, 26.4–28.4 (27.2). *Adult female:* Wing, 260.1–276.1 (267.5); tail, 111.0–114.6 (112.3); bill, 24.9–26.9 (26.2); height of bill, 7.6–8.9 (8.4); tarsus, 29.9–32.0 (31.5); middle toe, 25.4–27.9 (26.7).

RANGE: Locally in Arctic; in North America, from n. Alaska, n. Mackenzie, s. Victoria Island and n. Greenland, south to n. Keewatin, Southampton Island, and s. Baffin Island. Winter range not entirely defined; in South America, known to winter along and off coast of Peru; also in Atlantic. Rare straggler in interior s.e. Canada and United States.

TEXAS: *Accidental:* One specimen (see species account).

GULL-BILLED TERN, *Gelochelidon nilotica* (Gmelin)

SPECIES ACCOUNT

A somewhat atypical tern—chunky-bodied with short, thick, rather heavy black bill; broad wings; slightly forked tail. *Nuptial adult:* white with very pale gray mantle; black cap; rather long, black legs. *Winter adult:* similar but lacks cap; whitish head with small crescentic blackish spot before eye and blackish postocular smudge. Length, 14½ in.; wingspan, 3 ft.; weight, 5½ oz.

RANGE: Very locally, chiefly on marine coasts, in tropical and warm temperate parts of world. Wanders widely, North American birds wintering coastally from Mexico, Texas, Louisiana, and c. Florida, south locally to n. South America.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, early Apr. to mid-Aug. (eggs, Apr. 14 to July

17) just above sea level. Fairly common, nesting locally, to scarce along Gulf coast. *Vagrant:* Wanders inland very irregularly; has reached Falcon Reservoir, San Antonio, Austin, Waco, Dallas, and Denton, where casual.

HAUNTS AND HABITS: The almost white Gull-billed—named for its stout, unternlike black bill—is perhaps a link between the gulls and the earth's thirty-nine species of terns. In Texas, this cosmopolitan bird lives chiefly in and over salt marshes and wet coastal prairies and fields; sometimes a few individuals fly along bay shores. The present species and its cousins—Least, Royal, Sandwich, and Caspian terns—rest and nest locally in colonies on spoil banks (mud dumps) left after dredging of the Intracoastal Waterway, which canal traverses the entire length of the Texas coast. Nowadays the Gullbill usually appears singly or in pairs, but in years when it was more numerous, small, rather loose flocks gathered in the cooler months.

Flight is heavier and steadier than that of the smaller tern species; the Gullbill, however, moves swiftly when necessary. Largely insectivorous, the bird skillfully hawks over field and marsh for grasshoppers, locusts, dragonflies, beetles, and moths; less frequently about the edges of bays and lagoons, it feeds on small fish, crabs, and shrimp. In parts of the world where it inhabits inland watercourses, it adds water striders, other aquatic insects, and frogs to its diet. Seldom, if ever, does it dive or swim, although capable of doing both.

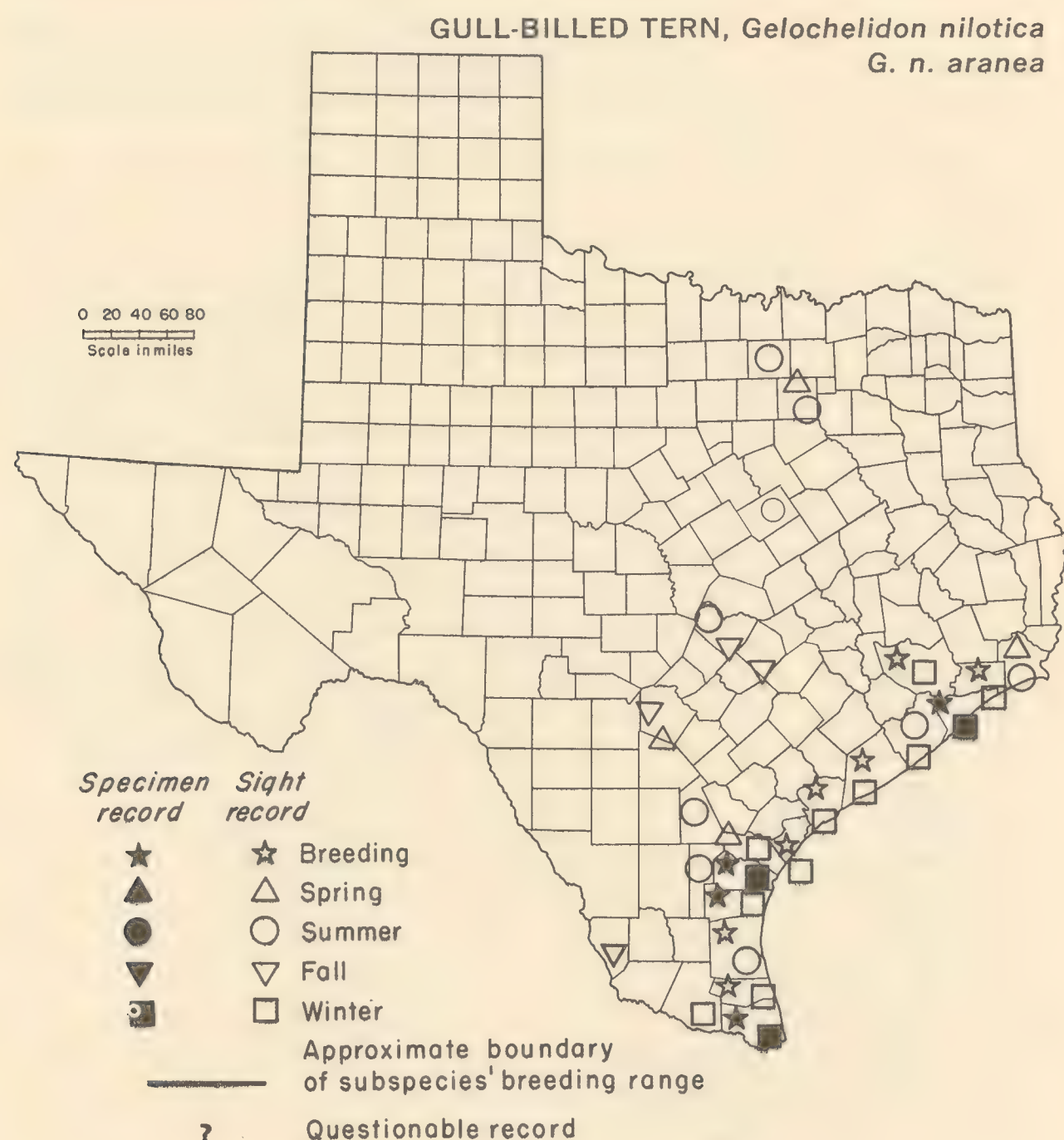
The Gull-billed Tern's common call is a throaty *za-za-za*. Especially on the breeding grounds, the bird utters loud, rasping *kay-weck, kay-weck's*. Like most terns, it is rather silent in winter, except when bickering over food.

CHANGES: In May and June of 1969, the Cooperative Fish-eating Bird Survey counted 32 Gull-billed Terns on the upper coast, 570 on the central coast, and 230 on the lower coast. The nesting stronghold was found to be on a group of spoil islands off Baffin Bay (Kleberg and Kenedy cos.). Though this tern is currently (1972) showing no drastic decline, it—like all fish-eating birds which nest in Texas—deserves watching in the future.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN GULL-BILLED TERN, *Gelochelidon nilotica aranea* (Wilson)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Pileum, nape, and upper half of lores black with metallic olive green sheen; remainder of upper surface, including wings and tail, between gull gray and pallid neutral gray, but tips of primaries, outer web of outermost, and broad stripe down shaft on inner web darker and somewhat brownish, shafts of primaries yellowish white; entire lower surface, including lining of wing, axillars, cheeks, and sides of neck, pure white. Bill black; inside of mouth flesh color; iris vandyke brown; legs and feet dark walnut brown or bay, webs and soles of toes rufous or light pinkish brown; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but head and neck white, hindneck washed with pale neutral gray; ear-coverts and small spot in front of eye deep mouse gray. *First nuptial:* Acquired by complete prenuptial



molt. Like nuptial adults. *First winter*: Acquired by partial postjuvinal molt. Similar to adults in winter, but upper parts duller; pileum and hindneck with narrow shaft streaks of dull black or dark brown; tail with some indication of dull blackish markings. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter plumage, but bill much smaller; tail much less forked; pileum and hindneck often narrowly streaked or spotted with hair brown, entire upper surface, including wing-coverts, more or less suffused, or feathers tipped, with pale clay color or dull pale buff; back, scapulars, and tertials with small shaft spots near tips; lining of wing white. Tip of bill dull buffy brown, mandible and base of maxilla dull ochraceous brown; iris bone brown; legs and feet dull reddish brown to natal or army brown. *Natal*: Upper parts dull buff or grayish buff, forehead immaculate, remainder of upper parts more or less spotted irregularly with dull black or fuscous black, these markings more or less in form of two stripes on back; lower parts white or buffy white. Bill dull brown, mandible inclining to orange; legs and feet brownish orange.

MEASUREMENTS: *Adult male*: Wing, 288.0–316.0 (average, 301.0) mm.; tail, 104.6–125.0 (114.8); bill (exposed culmen), 37.1–41.4 (38.9); height of bill at base, 11.9–14.0 (12.7); tarsus, 26.9–32.0 (29.4); middle toe without claw, 20.1–23.6 (21.4). *Adult female*: Wing, 275.1–302.0 (292.4); tail, 103.1–121.4 (112.3); bill, 35.1–38.1 (36.6); height of bill, 11.7–13.5 (12.4); tarsus, 27.4–31.0 (29.2); middle toe, 20.1–22.1 (20.9).

RANGE: Locally on Atlantic and Gulf coasts from Maryland and Virginia to Florida (inland casually to Lake Okeechobee) and Texas; also Bahamas and Virgin Islands. Nonbreeders summer casually to Panama. Winters coastally from Florida, Louisiana, and Texas to Surinam; also Trinidad.

TEXAS: *Resident* (fewer in winter): Collected along coast northeast to Galveston, southwest to Cameron cos.

NESTING: *Nest*: In colonies; on spoil banks, flats, shores, and grassy areas of islands, or mainland along seacoast; in sandy or shell-strewn areas, or on grassy flats and marshes; in depression in grass or hollow in sand, but consisting sometimes of considerable heap of materials, such as grass, grass stalks, sedges, and shells; lined with bits of straw and various shells. *Eggs*: 1–4, usually 2–3; ovate or short ovate; buff, ivory yellow, or greenish buff, spotted with various shades of brown, with shell markings of drab and dull violet; average size, 47.0 × 34.0 mm.

FORSTER'S TERN, *Sterna forsteri* Nuttall

SPECIES ACCOUNT

A medium-sized tern. *Nuptial*: white with gray mantle; black cap; rather long, deeply forked gray tail (outer edges white); wing shows considerable silvery on dorsal surface of primaries; has black-tipped (variable) orange bill. *Winter*: loses cap—instead wears elongated black eye-patch on side of head; bill largely blackish. Length, 14¾ in.; wingspan, 31; weight, 5 oz.

RANGE: Locally on interior lakes of cool temperate North America; also on coasts of Maryland, Virginia, Louisiana, Texas, and n. Tamaulipas (probably). Winters coastally from California and South Carolina to Guatemala.

TEXAS: (See map.) *Breeding*: Early Apr. to mid-July (eggs, Apr. 12 to June 10; dependent young as late as July 11) just above sea level. Fairly common along Gulf coast, nesting locally. Apparently declining; nesting evidence scarce since 1945. *Migration*: Late Mar. to early June; late July to late Oct. (extremes: Feb. 22, June 19; July 12, Nov. 3). Common along coast; uncommon to rare inland, but largely absent in desert

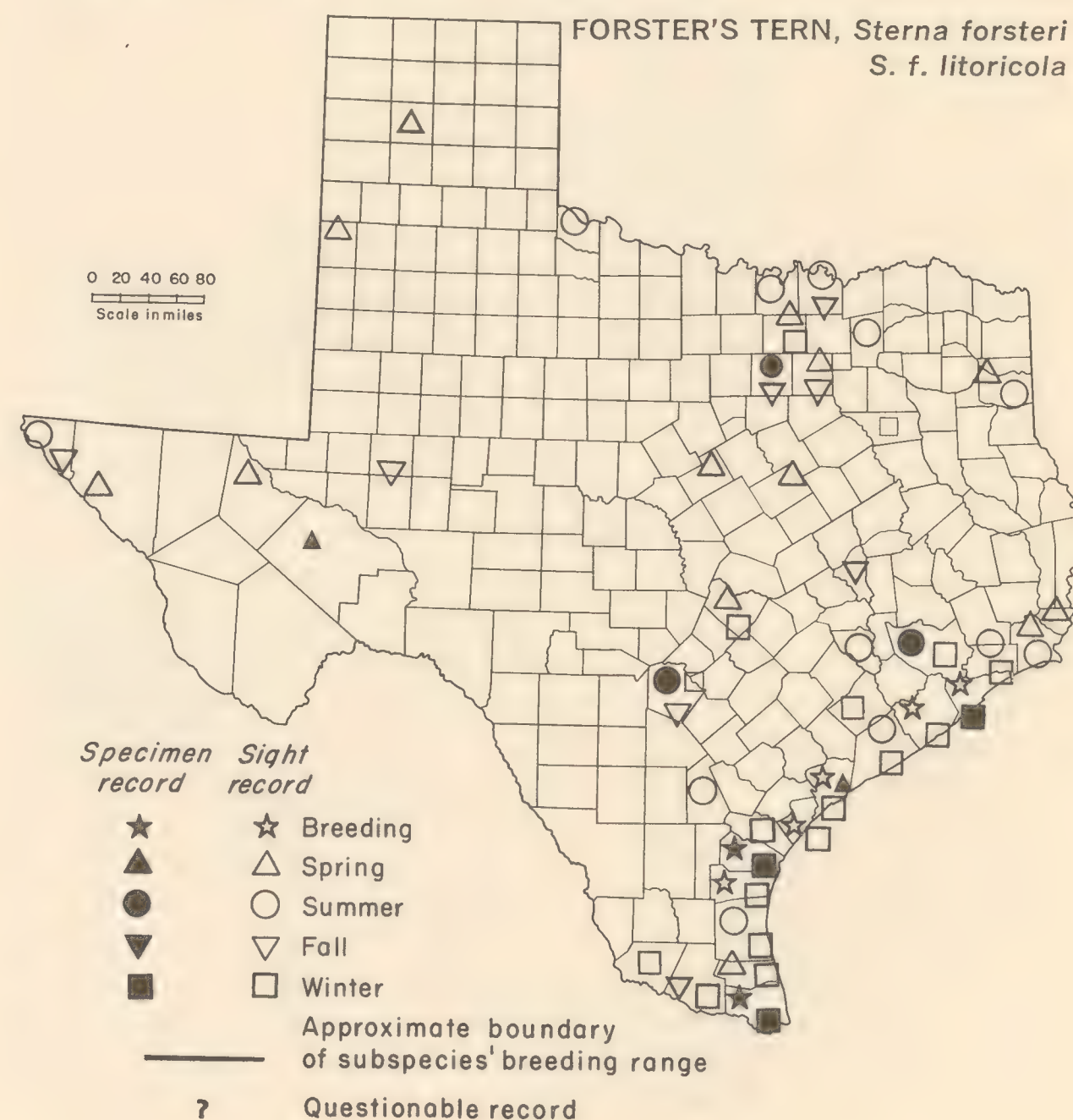
areas. *Winter*: Nov. to mid-Mar. Common to fairly common along coast; rare to casual inland, reaching San Antonio, Austin, and Dallas.

HAUNTS AND HABITS: Unlike three close relatives—the Common, Arctic, and Roseate terns—Forster's Tern is strictly North American instead of cosmopolitan. In Texas, it nests chiefly on more or less grassy islands in salt bays, but during migration and in winter it ranges sandy open beaches, lagoons, and inlets with other terns and gulls. In the cold months along northern Gulf shores it is usually more numerous than the Common Tern. In the interior of temperate North America, fresh marshes of prairies and plains about lakes and rivers support local breeding colonies of this tern. It gathers into flocks of considerable size, but is also found in small companies and singly.

Flight of the Forster's is swallowlike, airy, and graceful, at times swift and even long sustained; the present species flies with a quick snap of its wings, making its strokes faster and shallower than those of the Common Tern. When feeding, it flaps not far above the water, sometimes plunging, but more often skimming the surface—remaining dry as it picks up small fish and other aquatic animal life. Forster's also catches insects on the wing as it courses about over marshes. Like other terns, it occasionally mounts high in the sky. While capable of swimming, it rests very infrequently on the water, seeming to prefer the air for many of its activities.

Usual notes of the Forster's Tern are a harsh, low-keyed *za-a-ap* or *tza-a-ap* and a nasal *keer* similar to the more drawn out *kee-arr* of the Common Tern; immature *Sterna forsteri* utter distinctive high-pitched squeals. The bird is noisy in the breeding season, much less so in winter.

CHANGES: The Forster's Tern appears to have been



declining as a breeder in Texas at least since World War II. There are, in fact, remarkably few reports of actual nestings in the state between 1945 and 1972; during this same time span, nests of the other regularly breeding Texas terns—Gull-billed, Sooty, Least, Royal, Sandwich, and Caspian—have been reported with fair frequency in *Audubon Field Notes* (now *American Birds*) and elsewhere. Considering that the Forster's was regarded as a fairly common breeder in 1940 and an abundant one before 1900, the recent scarcity of nesting records seems ominous.

Apparently the latest detailed account of actual nesting was reported by Sandy Sprunt, et al.; on May 30, 1959, he and his party found 135 pairs in a colony on Vingtune Island, Chambers County. The 1959 record was unearthed by F. S. Webster, Jr., long-time South Texas editor for *Audubon Field Notes*; his area covers all of the Texas coast.

Ever increasingly since World War II, the coast and all its islands are stomped flat by hordes of fishermen, hunters, and tourists; concurrently, pollution from coastal petrochemical plants and many other sources has been increasing. The disturbance factor seems to have been especially hard on the Forster's Tern because it nests chiefly on islands high enough to support grass. Such islands have been invaded more frequently by landing parties than the oyster, shell, and mud spoil banks used for nesting by other tern species. Landing on a tern island frightens adults away from their nests; direct exposure to sun can destroy eggs or very young chicks in only a few minutes.

In May and June, 1969, the Cooperative Fish-eating Bird Survey found 581 Forster's Terns on the upper coast, 230 on the central coast, and 50 on the lower coast.

DETAILED ACCOUNT: TWO SUBSPECIES

WESTERN FORSTER'S TERN, *Sterna forsteri forsteri* Nuttall

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Upper half of lores, pileum, and nape black; remainder of upper surface, including wings and tail, pallid neutral gray, upper tail-coverts white; outer web of outermost tail feather white or nearly white, inner web gray like rest of tail; tips and inner part of inner webs of secondaries white, outer web of outermost primary and broad stripe along shaft on inner web darker and somewhat brownish, particularly on inner web, as are also tips of most of primaries; exposed surface of primaries hoary and somewhat paler than back, shafts of primaries yellowish white; entire lower surface white. Basal half or two-thirds of bill rufous, dull maize yellow, orpiment orange, apricot orange, or orange buff; terminal portion black, dull greenish black, or dark brown, tipped with white; inside of mouth orange; edges of eyelids black; iris raw umber or fuscous; legs and feet orange, orange-red, cadmium orange, rufous, or flame scarlet; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but lateral tail feathers shorter, tips broader; top and sides of head mostly white; occiput and nape more or less washed with slate gray; large oblong spot on side of head, beginning in front of eye and extending to nape, dull black or chaetura black. Bill black, dark seal brown, but base of mandible russet vinaceous, dull vinaceous rufous, or dull lake, and tip yellowish white; inside of mouth capucine

yellow; iris seal brown or vandyke brown; legs and feet bitter-sweet orange, apricot orange, or dull orange rufous; claws black. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by complete prenuptial molt. Very similar to nuptial adults, but often wings or head resemble those of first winter. Bill mostly dark clove brown, but base of mandible russet vinaceous; iris slate black; legs and feet dull brownish orange or salmon orange, webs of toes sometimes claret brown above. *First winter:* Acquired by partial postjuvenile molt and wear from juvenal. Similar to adults in winter, but tail shorter and less deeply forked; upper tail-coverts shorter; back, scapulars, and wing-coverts with some mottlings or edgings of dull buff or light fuscous; ends of tail feathers darker and somewhat more brownish; wings sometimes darker. *Juvenal:* Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller; all upper parts overlaid with drab, wood brown, or buffy brown, upper tail-coverts only slightly tinged with this color, tail feathers and wing-coverts, as well as tertials and scapulars, more or less tipped with same color. Bill terminally dark brown or black, but somewhat reddish or pinkish white at base; iris prout brown; legs and feet yellow, or cream buff tinged with vinaceous buff; claws black. *Natal* (this plumage of this race not seen in Texas): Upper surface light buffy brown or avellaneous, spotted irregularly with black or clove brown; cheeks pale pinkish buff or cinnamon buff; throat dull wood brown, buffy brown, pale dull clay color, or pale buff; remainder of lower surface dull white or buffy white. Bill light brown at base, dull brown at tip; feet light brown.

MEASUREMENTS: *Adult male:* Wing, 248.9–270.0 (average, 261.4) mm.; tail, 164.1–204.0 (182.9); bill (exposed culmen), 38.6–40.4 (39.6); height of bill at base, 9.9–11.4 (10.7); tarsus, 23.1–24.9 (24.1); middle toe without claw, 20.1–22.6 (21.9). *Adult female:* Wing, 250.0–269.0 (259.1); tail, 161.5–192.0 (173.3); bill, 36.6–40.9 (37.8); height of bill, 9.4–10.9 (10.2); tarsus, 23.1–23.9 (23.6); middle toe, 21.1–23.1 (22.4).

RANGE: C. Washington to c. Manitoba, south to c. California, n. Nebraska, and s. Wisconsin. Nonbreeders summer east to Ohio, south to State of México. Winters from w. California and s. Texas through Baja California and w. mainland Mexico to s. Guatemala.

TEXAS: *Migration:* Collected northwest to Pecos, east to Bexar (June) and Calhoun, south to Cameron cos. Uncommon. *Winter:* Two specimens: Cameron Co., Brownsville (Jan. 13, 1912, A. P. Smith; Feb. 19, 1894, F. B. Armstrong).

NESTING: (This race does not nest in Texas.) *Nest:* In colonies; in marshes, on sandy islands, or marshy borders of lakes; in grass, other heaps of vegetation; sometimes well constructed, sometimes poorly made; composed of grasses, sedges, deeply hollowed and lined with weeds and grasses. *Eggs:* 2–6, usually 3; short ovate to ovate and elongate ovate; tawny olive to cartridge buff; with rather small spots and a few large blotches of shades of dark brown, and shell markings of lilac; average size, 42.7 × 30.2 mm.

EASTERN FORSTER'S TERN, *Sterna forsteri litoricola* Oberholser

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Similar to *S. f. forsteri* but decidedly smaller, particularly wing and tail; upper parts paler. *Natal:* Probably similar to *S. f. forsteri*.

MEASUREMENTS: *Adult male:* Wing, 239.0–259.1 (average, 250.7) mm.; tail, 150.1–183.1 (168.7); bill (exposed culmen), 38.6–41.9 (40.1); height of bill at base, 9.7–11.4 (10.7); tarsus, 23.1–25.9 (23.9); middle toe without claw, 20.1–23.1 (21.9). *Adult female:* Wing, 245.1–256.0 (250.2); tail, 141.0–170.9 (156.2); bill, 36.6–40.9 (39.4); height of bill, 8.9–10.4 (9.7); tarsus, 22.1–23.9 (23.4); middle toe, 20.1–22.6 (21.4).

RANGE: On coasts of Maryland, Virginia, Louisiana, and Texas. Winters coastally from South Carolina to s. Texas; southern limits of range imperfectly known, but probably to s. Guatemala, and from s. Baja California to Isthmus of Tehuantepec.

TEXAS: *Breeding*: Collected along coast northeast to Harris and Galveston, southwest to Cameron cos. *Winter*: Taken in Galveston, Nueces, and Cameron cos. Fairly common.

NESTING: Similar to that of *S. f. forsteri*, but usually on coastal islands; average egg size, 43.2×30.7 mm.

COMMON TERN, *Sterna hirundo* Linnaeus

SPECIES ACCOUNT

A medium-sized tern. *Nuptial*: white with gray mantle; black cap; deeply forked white tail (outer edges dark gray); wing shows considerable blackish on dorsal surface of primaries; has black-tipped (variable) orange-red bill. Compare carefully with nuptial Forster's Tern. *Winter*: cap reduced to black patch on back of head; bill largely blackish, reddish basally. Length, 14 in.; wingspan, 31; weight, $3\frac{3}{4}$ oz.

RANGE: Locally on coasts and large inland lakes of cool (chiefly) temperate Northern Hemisphere. Winters from southern limits of breeding range, south well into Southern Hemisphere.

TEXAS: (See map.) *Breeding*: Mid-Apr. to mid-July (eggs, May 16 to June 15) just above sea level. Formerly along Gulf coast, nesting very locally: islands in Galveston Bay (breeding abundantly, eggs located, June 1-3, 1864, H. E. Dresser); islands in West Bay near Galveston (large colony, nests with eggs, June 1-3, 1864, Dresser); Bird Island in San Luis Pass, Brazoria Co. (eggs inspected, June 15, 1930, J. M. Heiser, Jr.); islands in Cedar Lakes, Brazoria Co. (3 small breeding colonies, eggs inspected, May 17, 1923, A. C. Bent); South Bird Island, Kleberg Co. (eggs inspected, May 30, 1910, C. E. Farley); islands in Bahía Grande, Cameron Co. (several thousand birds observed, eggs and young found, May 16, 1921, and young in nests,

May 23, 1921, J. R. Pemberton). No recent evidence of nesting; nonbreeders summer rarely along coast. *Migration*: Early Mar. to mid- or late May; mid-Aug. to mid-Nov. (extremes: early Feb., June 4; Aug. 1, Dec. 26). Common to fairly common along coast; rare to casual inland. *Winter*: Late Dec. to late Feb. Uncommon to scarce along coast; casual inland, where recorded at San Antonio (2 on Audubon Christmas Bird Count, Dec. 27, 1964, C. R. Bender, compiler) and Dallas (1 on Christmas Bird Count, Jan. 2, 1965, Leonard Huffhines, compiler).

HAUNTS AND HABITS: The Common—so called because in most localities in Europe and temperate North America it is the most numerous of the Sterninae—seeks sandy beaches, islands, and spoil banks for breeding grounds, thereby mostly leaving salt marshes to the pale Gull-billed and silver-winged Forster's terns. Common Terns pass singly or in flocks along Gulf beaches and rarely inland about lakes or rivers. On coasts north of Texas where substantial numbers nest, the Common gathers in loose flocks in the vicinity of the breeding colonies or rests on sandbars and flats in large, close-knit groups.

On the wing, the Common, like its fellows, is strong, buoyant, and graceful. The bird hovers, then drops, often entirely submerging, to seize minnows, menhaden, other small fish (rarely more than three inches in length), the fry of large fish, and a few shrimp; on fresh water it also skims the surface for aquatic insects.

The Common Tern's harsh, angry-sounding *kee-arr*'s, which descend in pitch, are drawled on and over the nesting ground. The bird also utters high-pitched, rapid-fire *kik-kik-kik* notes. The latter vocalization, sounded as the bird hovers over fishing waters, is the one chiefly heard in Texas.

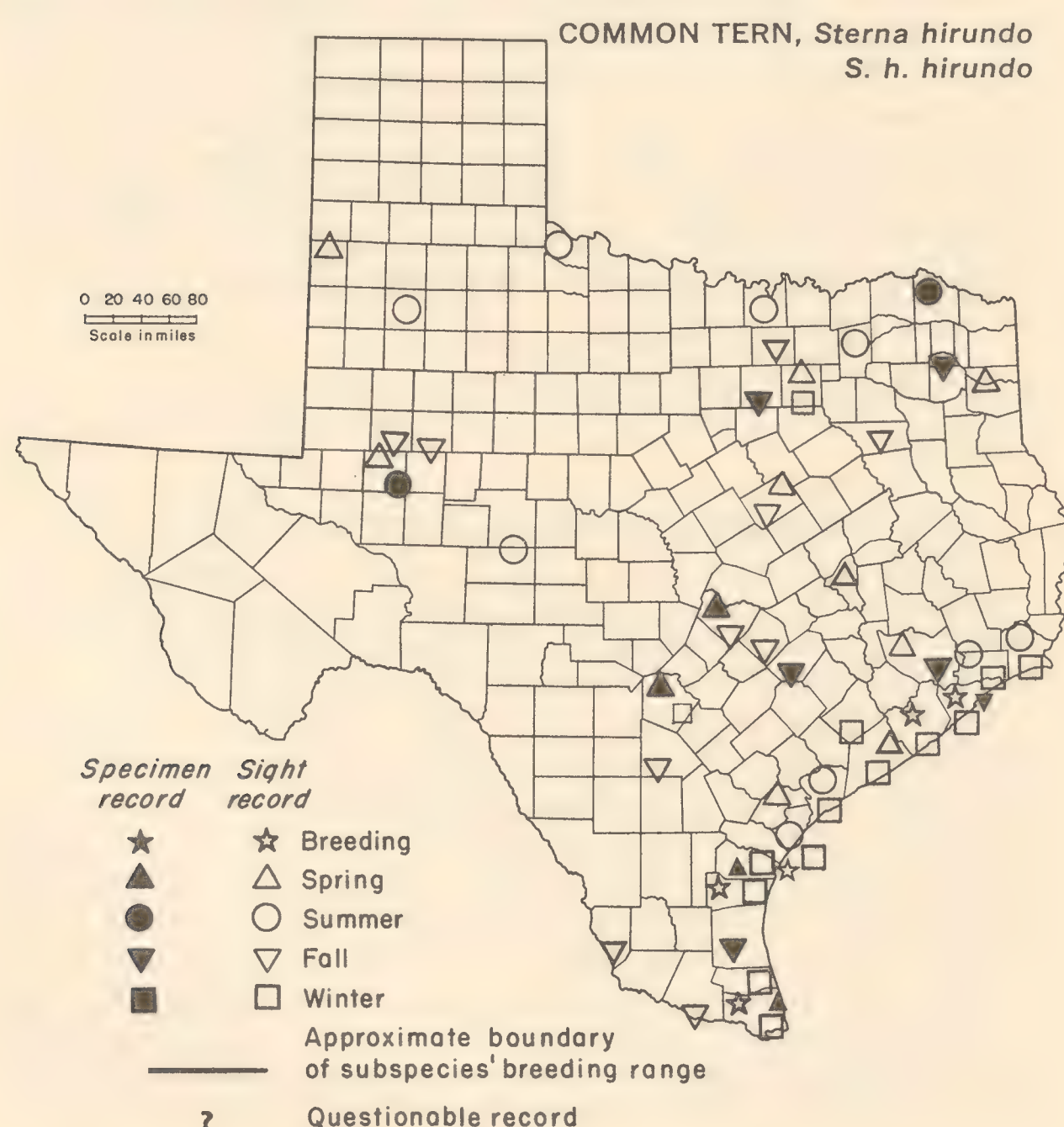
CHANGES: H. C. Oberholser considered the Common Tern a very local breeder at or near sea level along the Texas coast. Perhaps some of Dr. Oberholser's correspondents based their reports on the Forster's Tern, which in breeding plumage closely resembles the Common. In any case, authenticated Common Tern nestings within Texas seem to be lacking since 1930.

In May and June of 1969, the Cooperative Fish-eating Bird Survey found 10 Common Terns on the upper coast. Compilers of this annual report, G. W. Blacklock and H. H. Hildebrand, wrote that this is one of the few records of *Sterna hirundo* on the Texas coast at this season.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN COMMON TERN, *Sterna hirundo hirundo* Linnaeus

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Pileum, nape, and upper half of lores black; rest of upper surface, including wings, pale neutral gray; upper tail-coverts and tail white, outer web of outermost tail feather deep neutral gray; secondaries and tertials tipped with white, secondaries mostly white on inner webs; outer web of outermost primary black; inner webs of four outermost primaries with very broad stripe of dark neutral gray next to shaft; most of



webs of remaining primaries, together with subterminal portion of most of primaries, deep neutral gray; lower tail-coverts white; sides of head and of neck white or grayish white; remainder of lower surface pallid neutral gray; lining of wing white. Bill vermilion, coral red, scarlet, or orange vermilion, but tip dull black except on cutting edges; inside of mouth and tongue coral red or orange vermilion; edges of eyelids black; iris prout brown, seal brown, or brownish black; legs and feet orange vermilion; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but forehead, crown, and most of lores white, crown mixed with black, nape and occiput dull black, continuous broad black stripe through eye; tail less deeply forked, mostly pale gray like back; under parts white without grayish tinge. Bill black or brownish, duller than in nuptial, base of mandible chocolate or reddish; legs and feet brick red. *First nuptial*: Attained by complete prenuptial molt. Similar to nuptial adults, except outer tail feathers are somewhat shorter, but occasionally juvenal plumage is like that of adults in winter, which persists during spring and summer. *First winter*: Acquired by partial postjuvenal molt. Similar to adults in winter, but tail less deeply forked and darker; from juvenal retains dark band formed by anterior lesser wing-coverts, with tinge of buff on tips of these feathers. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller; tail shorter; black of sides and back of head duller; crown and lores avellaneous, black of hind-head much interrupted by dull white or dull pale brown tips of feathers; wings darker, anterior lesser coverts and primary coverts chaetura drab or hair brown, somewhat mixed with pale gray, dull white, or buff; superior wing-coverts, scapulars, and back edged with avellaneous or pinkish buff, and feathers of back, scapulars, and tertials with subterminal bar of hair brown or chaetura drab; upper tail-coverts and tail feathers tipped with pinkish buff. Basal part of bill light salmon orange, rufous, orange rufous, yellow, or tawny olive; remainder of bill black, olivaceous black, or brownish black, and sometimes dull white at tip; inside of mouth yellow rufous or pale flesh color; tongue salmon buff; corner of mouth salmon orange; eye-ring black; iris dark burnt umber or brownish black; legs and feet yellow, orange, orange rufous, yellowish orange, salmon orange, salmon buff, russet, cinnamon brown, or clay color, but webs of toes sometimes verona brown or dusky drab; claws black. *Natal (spotted buff phase)*: This plumage exceedingly variable. Upper parts clay color, ochraceous buff, or cream buff, more or less irregularly marked with seal brown or sepia; under parts white, except for sepia, drab, or smoke gray throat. *Natal (spotted gray phase)*: Similar to spotted buff phase, but crown cartridge buff or pale olive buff, marked with black; back pale neutral gray, also spotted with black; throat bone brown. *Natal (unspotted buff phase)*: Upper parts ranging from clay color to pinkish cinnamon or cinnamon buff, unmarked with darker colors, and gradually merging laterally into white of lower parts; throat and jugulum smoke gray to brownish black.

MEASUREMENTS: *Adult male*: Wing, 256.0–273.0 (average, 265.4) mm.; tail, 140.0–166.6 (149.1); bill (exposed culmen), 33.0–39.6 (37.3); height of bill at base, 8.9–9.9 (9.4); tarsus, 18.0–20.6 (19.3); middle toe without claw, 16.5–18.0 (17.3). *Adult female*: Wing, 256.0–274.1 (265.9); tail, 140.0–161.5 (148.1); bill, 32.0–37.1 (35.1); height of bill, 8.1–9.9 (8.9); tarsus, 17.5–20.1 (18.8); middle toe, 16.0–18.0 (17.3).

RANGE: Locally in temperate Northern Hemisphere (excluding c. and e. Asia); in North America, on coasts and large inland lakes from c. Mackenzie to Newfoundland, south to Dakotas, Great Lakes region, and North Carolina; formerly locally to Texas and Florida (Dry Tortugas). In winter, wanders widely, chiefly in Southern Hemisphere; in North and South America, coastally from w. California to Ecuador, and from South Carolina to Brazil and Argentina.

TEXAS: *Breeding*: Collected in Nueces (1 specimen, Apr. 28, 1901) and Cameron (3, Mar. 17, 1879, Mar. 17, and Aug. 1, 1894) cos. *Migration*: Collected north to Red River (Aug. 7), south to Galveston and Cameron, west to Bexar and Midland cos.

NESTING: *Nest*: In colonies; on islands or mainland; about lakes (north of Texas) or seacoasts; on sandy, stony, or rocky ground, amid grass, or on sand or gravel; occasionally without nest material; sometimes in slight hollow or in broken-down vegetation; composed of grass, seaweed, sometimes fish bones, pieces of twigs, and rubbish; lined with pieces of shell, pebbles, straw, grass, or rubbish. *Eggs*: 2–7, usually 3; short ovate to ovate or elongate ovate; buff, pale brown, light green, greenish white, or white; blotched and spotted with various shades of brown, and with shell markings of olive gray, other grays, and lilac; average size, 41.4 × 29.9 mm.

[ARCTIC TERN, *Sterna paradisaea* Pontoppidan

Closely resembles Common Tern, but blood red bill is usually shorter and ordinarily lacks black tip; darker gray under parts and sides of neck separated from black cap by narrow white zone; primaries much paler, with blackish largely restricted to tips on underside of wing; bird at rest reveals longer tail (extends to tip of wing), shorter legs. Its Southern Hemisphere counterpart, the Antarctic Tern, *Sterna vittata*, has decidedly shorter tail (averages shorter than Common's). Length, 15½ in.; wingspan, 31.

RANGE: Circumpolar in arctic and subarctic regions, south on coasts and islands to n. British Columbia, Hudson Bay, Massachusetts, and n. Eurasia. Winters in antarctic and subantarctic regions, north to coasts of s. South America and South Africa.

TEXAS: *Hypothetical*: Two careful sightings along Gulf coast: Harris Co., La Porte (1 after Hurricane Carla, Sept. 13, 1961, Linda Snyder); Nueces Co., south jetty at Port Aransas (1 in summer plumage, Aug. 19, 1968, V. L. Emanuel, E. B. Kincaid, Jr., J. L. Rowlett).]

ROSEATE TERN, *Sterna dougallii* Montagu

SPECIES ACCOUNT

Closely resembles darker-mantled Common Tern, but slenderer bill almost completely black even during breeding season (then often dark red basally, but seldom more than basal third); tail longer, whiter, and more deeply forked, the terminal feathers extending well beyond tip of folded wing; breast of nuptial bird tinged with pink. See voice discussion. Length, 15½ in.; wingspan, 28¼; weight, 4 oz.

RANGE: Locally on coasts and islets of Atlantic, Indian, and Pacific oceans. Winters mainly over tropical seas, Atlantic birds reaching coastal Brazil.

TEXAS: (See map.) *Vagrant*: Dec. 25 to Aug. 23. Rare to casual along Gulf coast.

HAUNTS AND HABITS: In North America on coastal beaches and islands, the Roseate Tern—named for the delicate rosy blush on its breast in the breeding season—nests in colonies where it lays its eggs on bare ground or some scanty rubbish, either on open flats or amid thick, often rank, beach grass. In winter, *Sterna dougallii* tends to be pelagic. Roseate Terns are only

casual visitors along Gulf shores of Texas, but where the species is common, considerable flocks gather.

Long, slim, and with very deeply forked tail, the Roseate is well equipped for easy, buoyant flight, and at times it is exceedingly swift. Like other terns, it sometimes flies high in the sky, but usually stays a moderate distance above the water, from which elevation it plunges adeptly, often submerging, for small fish prey; about the Massachusetts breeding grounds, its diet consists largely of the sand lance (*Ammodytes americanus*). Roseates are said to track schools of bluefish (*Pomatomus saltatrix*) which turn up the small fry upon which both the fish and tern feed; apparently the bird's southerly migration closely follows the departure of this marine species. In winter, the Roseate tends to be pelagic. This tern seems to prefer air to water, and when not on the wing, it rests chiefly on the beach.

Call of the Roseate Tern is a grating *ka-a-ak* or *aark*, frequently compared to the sound of ripping cloth. Soft *chu-ick's*, *ku-lick's*, or *chivy's* are repeated incessantly by young and adults in late summer on the breeding grounds. This bird is heard extremely seldom in Texas.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN ROSEATE TERN, *Sterna dougallii dougallii*

Montagu

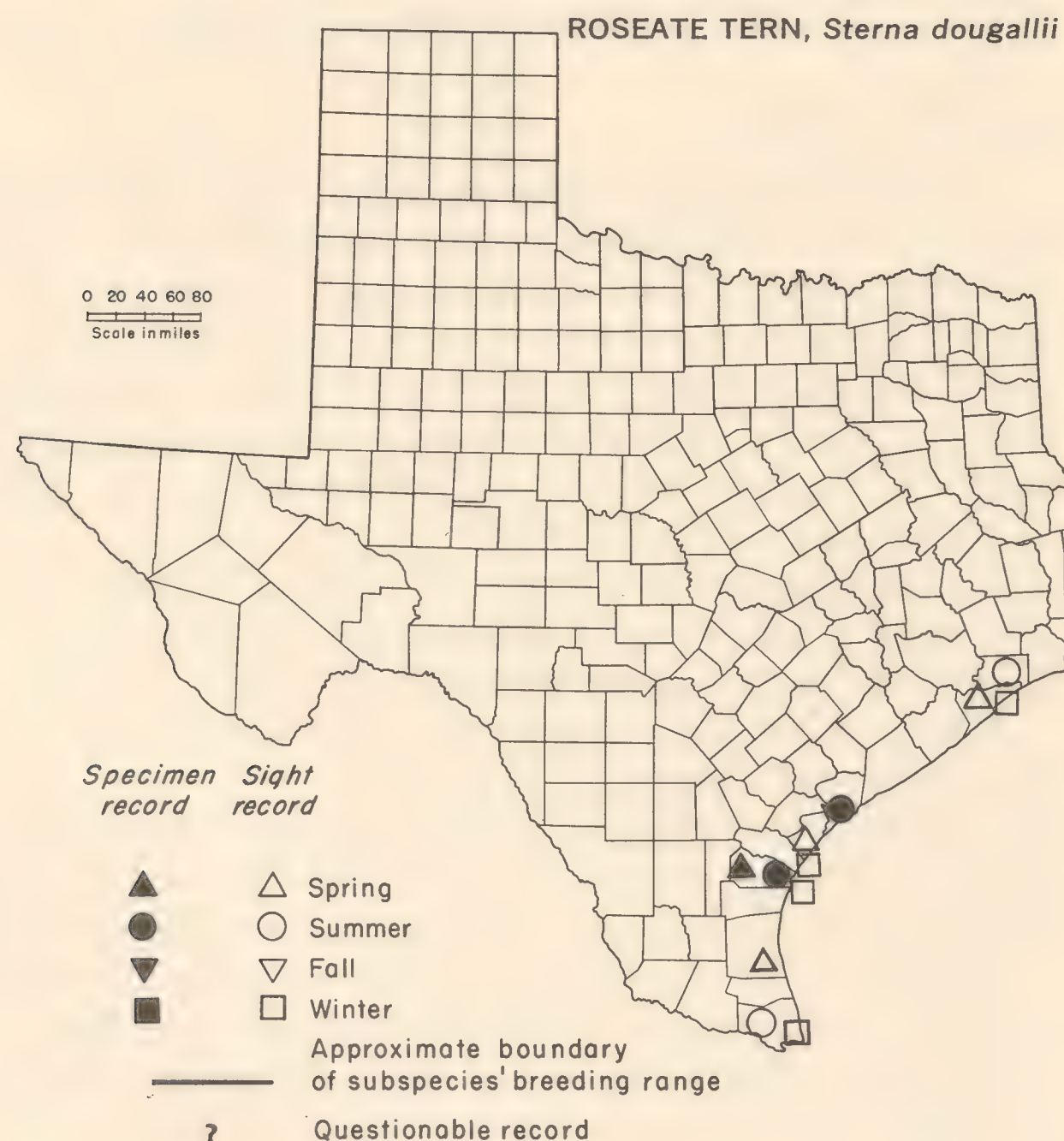
DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Pileum, hindneck, and upper half of lores glossy black with sometimes faint purplish sheen; cervix, sides of head below eyes, and entire lower surface, including lining of wing, white; in life lower surface of body suffused with pink; back, wing-coverts, scapulars, tertials, secondaries, and inner primaries pallid neutral gray; rump, upper tail-coverts, and tail white, very slightly tinged with gray; outermost primaries with outer webs, tips, and broad stripe along shaft on inner webs

chaetura black or blackish slate, washed with hoary gray, shafts of feathers pure white, remainder of primaries with broad white tips on inner webs; secondaries broadly tipped with white, and innermost chiefly white on inner webs. Bill vermilion or scarlet at base, black on terminal half to two-thirds, occasionally all black; inside of mouth red or orange-red; iris dark brown; legs and feet coral red or vermilion; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults, but forehead and anterior part of crown grayish white, streaked with dull black; inner primaries darker. Bill black, tip somewhat yellowish, base somewhat brownish; legs and feet orange-red. *Second winter:* Acquired by complete postnuptial molt. Identical with adults in winter. *First nuptial:* Acquired by complete prenuptial molt. Very much like adults in winter, but forehead more purely white; anterior part of crown more whitish and less streaked with brown or black; outer webs of all but white tail feathers somewhat darker; secondaries and lesser wing-coverts also somewhat darker. *First winter:* Acquired by partial postjuvinal molt. Similar to adults in winter, but tail less deeply forked; band on anterior lesser wing-coverts dark gray. *Juvenal (gray phase):* Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller, tail shorter and less deeply forked; forehead and crown mostly dull gray tinged with buff and with very small dots of fuscous black; occiput similar, with coarser markings; broad stripe from in front of eye to nape fuscous black, more or less vermiculated with buff or dull white, these markings most numerous on hindneck; back, scapulars, and tertials much vermiculated and spotted with pale buff and with subterminal dark spots or irregular bars of hair brown or chaetura drab; tail darker gray than in adults, with mottlings or spots of hair brown near tips of feathers; primary coverts and anterior lesser coverts hair brown or deep mouse gray, edged with buff or grayish white, and on lesser coverts forming a distinct bar on forewing. Bill dark brown or dull black; legs and feet pale orange-red, dull brown, or black. *Juvenal (buff phase):* Similar to gray phase, but upper parts decidedly more buffy; markings of back, scapulars, and tertials more pinkish buff or pale cinnamon buff, instead of very pale buff.

MEASUREMENTS: *Adult male:* Wing, 222.0–236.5 (average, 230.1) mm.; tail, 167.9–215.1 (187.7); bill (exposed culmen), 36.1–40.4 (38.4); height of bill at base, 8.4–9.4 (8.6); tarsus, 18.0–20.1 (19.0); middle toe without claw, 17.0–18.5 (17.8). *Adult female:* Wing, 218.4–228.6 (225.3); tail, 137.9–198.1 (167.9); bill, 36.1–39.9 (37.6); height of bill, 8.1–8.9 (8.6); tarsus, 18.5–20.1 (19.3); middle toe, 16.8–18.5 (17.8).

RANGE: Locally on coasts and islands of Atlantic and Indian oceans; in North America, from Nova Scotia to Florida's Dry Tortugas; also Bermuda, Bahamas, and West Indies. Nonbreeders summer casually on Texas Gulf coast. Winters widely on coasts of Atlantic and Indian oceans, largely withdrawing from North Atlantic; in Caribbean and South America, from West Indies to Brazil.

TEXAS: *Vagrant:* Three specimens: Calhoun Co., s.w. Matagorda Island (July 22, 1937, A. R. Hines); Nueces Co., Lydia Ann Island (July 7, 1929, F. Harper); Nueces Co., Corpus Christi (Apr. 10, 1901, F. B. Armstrong).



SOOTY TERN, *Sterna fuscata* Linnaeus

SPECIES ACCOUNT

A medium-sized tern. *Adult:* mostly black above; pure white on forehead and under parts; deeply forked black tail (outer edges white); sharp black line from slender black bill through eye to cap; largely blackish flight feathers contrast with white wing-lining. *Immature:* dark brown with white spots on mantle; whitish belly, crissum. Length, 16½ in.; wing-span, 32.

RANGE: Locally on islets of warm seas. In winter apparently largely pelagic, occasionally reaching tropical coasts. Individuals transported by storms to various parts of world.

TEXAS: (See map.) *Breeding:* Late Apr. to early July (eggs, May 1 to June 15) just above sea level. Uncommon on spoil banks and islands along central coast, nesting irregularly; scarce along lower coast (periodic nesting likely); rare straggler to upper coast, where has bred near Galveston (nest with 1 egg located on Pelican Island, May 25, 1940, T. C. Meitzen). Regularly recorded in Texas from Mar. 26 to Oct. 4. *Winter:* Accidental on central coast (see detailed account). *Vagrant:* Wanders inland very casually, ordinarily prompted by hurricanes; has reached Falcon Reservoir (2 on Sept. 22, 1967, Mr. and Mrs. L. T. Adams), Bee Co. (see detailed account), San Antonio (1 on Sept. 13, 1961, C. R. Bender), Austin (see detailed account), and Dallas (1 on Aug. 29, 1932, 1 on Aug. 26, 1934, C. Kelley).

HAUNTS AND HABITS: The Sooty Tern is a major symbol of warm seas the world around. It gathers in large numbers on remote, small, tropical islands of the Atlantic, Indian, and Pacific oceans to nest. When nesting duties are over, this pelagic bird disperses and largely disappears from the sight of man as it flies over distant stretches of blue ocean unbroken by surf, sand, or rock. Considering the Sooty's worldwide habit of nesting on oceanic, tropical islets and avoiding mainland, except when blown in by extra-strong hurricanes, it is truly astounding that these terns, however few, are able to nest in Texas, where all the islands, regardless of size, are continental, nontropical, and subject to frequent visits by coyotes, rattlesnakes, raccoons, rats, and fishermen.

Sooty flight is firm and steady. Except during the

breeding season, it is on the wing a greater portion of the time. Seldom, if ever, does it perch on buoys or pilings (but it has been seen resting on floating pieces of wood); apparently this bird never swims or alights on water. It rides near-constant trade winds, soaring motionless for long periods or rising in circles until it vanishes in the sky. The Sooty does not dive for food as do many other terns; rather, it snatches small fish and squid with its bill as it flies along or hovers over the water, thus keeping its feathers dry. Flocks of Sooty Terns regularly follow schools of voracious game fish, such as tuna; as little bait fishes leap above the surface to escape huge onrushing jaws, some are deftly plucked from the air by these terns. All tropical marine fishermen worth their salt watch small Sooty Terns to locate big fish.

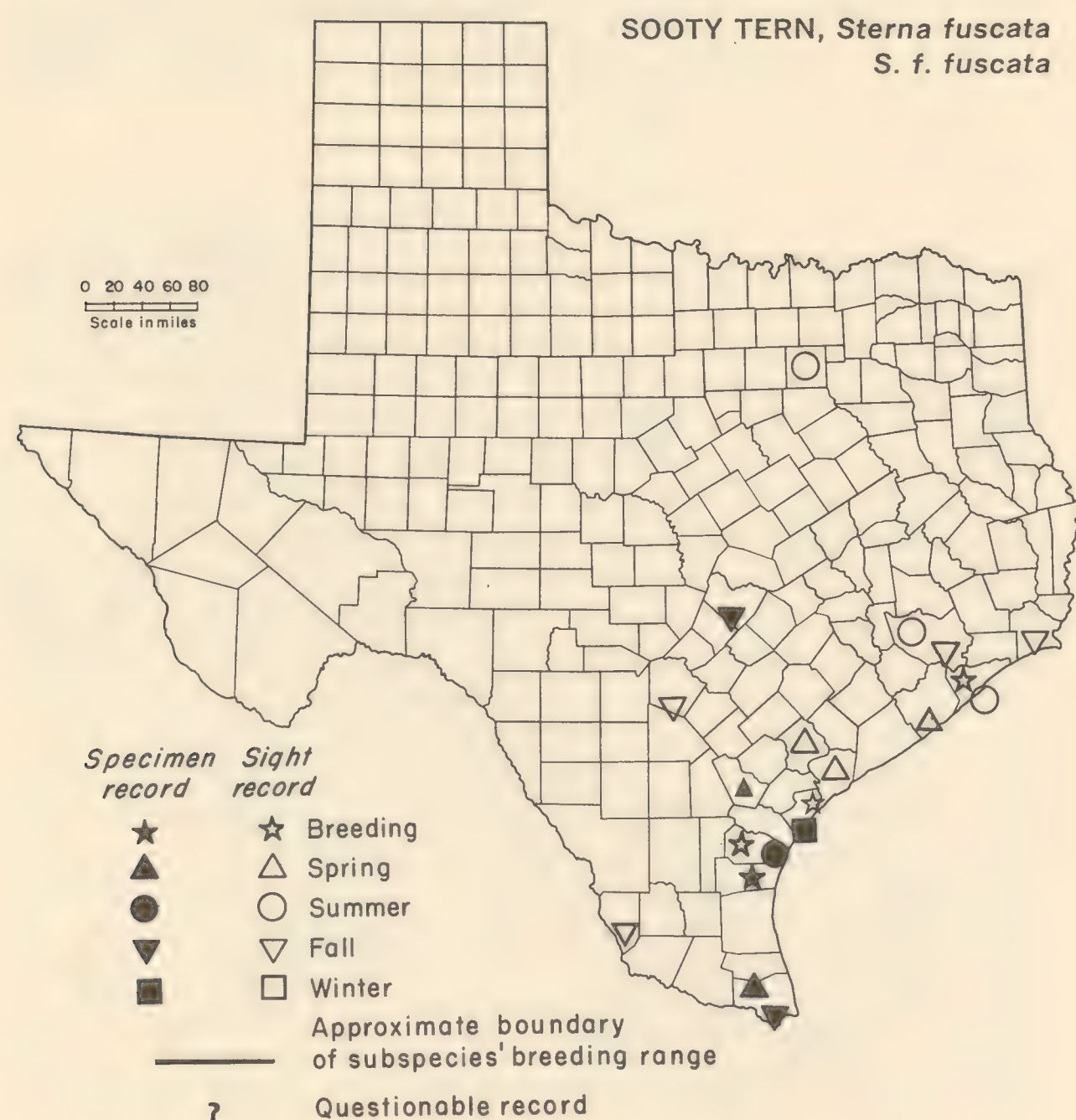
On the wing, which is to say most of the time, the Sooty Tern cries a nasal *wide-awake* or *ker-wacky-wack* and a squeaky *quanck*. On or near the nesting islands, these terns are very noisy and nervous, and utter barking noises and squawks—much like brooding hens—when disturbed. English-speaking mariners near bird islands around tropical latitudes call this species “wideawake,” both for one of its common calls and because most individuals seem to keep wide awake and hollering day and night. In their nonbreeding season, wideawakes are seldom seen, much less heard.

CHANGES: Because this tropical tern nests locally and in such small numbers on the Texas coast, its future in the state is highly precarious. During the census of May and June, 1969, the Cooperative Fish-eating Bird Survey found no Sooties on the upper coast, 23 on the central coast, and 1 on the lower coast; the largest group (17 individuals) was seen on Pelican Island in Corpus Christi Bay (Nueces Co.).

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN SOOTY TERN, *Sterna fuscata fuscata* Linnaeus

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Forehead white; broad loreal stripe, crown, occiput, and nape dull black; remainder of upper surface, including wings and tail, fuscous black or chaetura black; inner webs of primaries basally paler, outer tail feathers dull white except for terminal portion of inner web; sides of head below eye, sides of neck, and entire lower surface, including lining of wing, white, abdomen and crissum suffused with pale gray. Bill black; iris chestnut or dark brown; legs and feet black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults, but with white edgings on black feathers of lores and crown. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by wear from juvenal. Similar to juvenal, but with few or no light edgings on upper surface. *Juvenal:* Acquired by complete postnatal molt. Bill smaller than in adult; tail nearly square; upper parts clove brown or fuscous, feathers edged with paler brown; those of back, scapulars, and wing-coverts broadly tipped with white or buffy white; abdomen white, crissum pale brown. Bill black above, dull red below; eyes and feet dull red. *Natal (light phase):* Upper surface white or dull buffy white finely streaked with fuscous; sides of head and neck paler; lower surface white or buffy white, throat tinged with dull buff or gray. Bill brown; legs and feet brown or blackish brown. *Natal (dark phase):* Simi-



lar to light phase, but upper parts brownish black, with ochraceous buff tips on feathers of head and neck.

MEASUREMENTS: *Adult male:* Wing, 272.0–300.0 (average, 286.8) mm.; tail, 141.5–162.1 (153.7); bill (exposed culmen), 43.4–47.5 (45.2); height of bill at base, 10.9–11.9 (11.4); tarsus, 22.1–24.9 (23.4); middle toe without claw, 19.0–22.1 (20.9). *Adult female:* Wing, 270.0–290.1 (279.1); tail, 144.0–165.1 (153.7); bill, 42.4–45.0 (43.7); height of bill, 9.9–11.9 (10.7); tarsus, 21.9–24.4 (22.9); middle toe, 18.0–21.1 (19.8).

RANGE: Locally on coastal islands from Florida (Dry Tortugas) and Texas to Yucatán and Honduras; also West Indies, Los Hermanos, Fernando de Noronha, Ascension, and St. Helena islands. Winters mainly at sea; also on coasts of Brazil and Ascension, Tristan da Cunha, and Falkland islands.

TEXAS: *Breeding:* Collected in Nueces and Kleberg (eggs) cos. *Winter:* One specimen: Aransas Co., Rockport (Dec. 9, 1966, Doris N. McGuire; Welder Wildlife Refuge collection, no. 1309). *Vagrant:* Two specimens: Bee Co., Pawnee (injured female found, later died, Apr. 26, 1969, Louise Waters; Welder collection); Travis Co., Austin (found after Hurricane Carla, Sept. 13, 1961; identified by E. B. Kincaid, Jr., G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett, F. S. Webster, Jr., et al.; whereabouts of skin uncertain).

NESTING: *Nest:* Usually in colonies, sometimes large (but not in Texas); on sandy sea islands, sea beaches, or rocky cliffs; on bare beaches or rocks, sometimes sheltered by bushes or tall grass; eggs laid on bare ground in shallow depression or on lining of a few leaves, twigs, or small stones. *Eggs:* 1–3, usually 1; ovate to elliptical ovate; white, cream color, buff, or pinkish white; with sparse spots of various shades of brown, and occasionally black irregular lines and shell markings of grayish vinaceous; also some eggs are pure white, without markings; average size, 50.0 × 35.1 mm.

[BRIDLED TERN, *Sterna anaethetus* Scopoli

Resembles larger Sooty Tern, but mantle and tail brownish gray instead of black; whitish collar around hindneck separates mantle from black cap; black line from cap through eye to bill very thin; underwing pattern shows less contrast. Length, 15 in.; wingspan, 30.

RANGE: Very locally on small continental isles and oceanic islets in most tropical seas. Wanders over adjacent warm seas. Winter range imperfectly known, but nonbreeders apparently largely pelagic.

TEXAS: *Hypothetical:* Three careful sightings in and seaward of Galveston Co.: Galveston (1 on Sept. 10, 1961, J. B. Strickling); Galveston Bay at junction of Houston ship channel (1 on Sept. 13, 1961, L. E. Williams, Jr.); vicinity of large sargassum belt about 25 mi. out into Gulf (5 adults, apparently in prenuptial molt, May 16, 1971, J. A. Tucker).]

LEAST TERN, *Sternula albifrons* (Pallas)

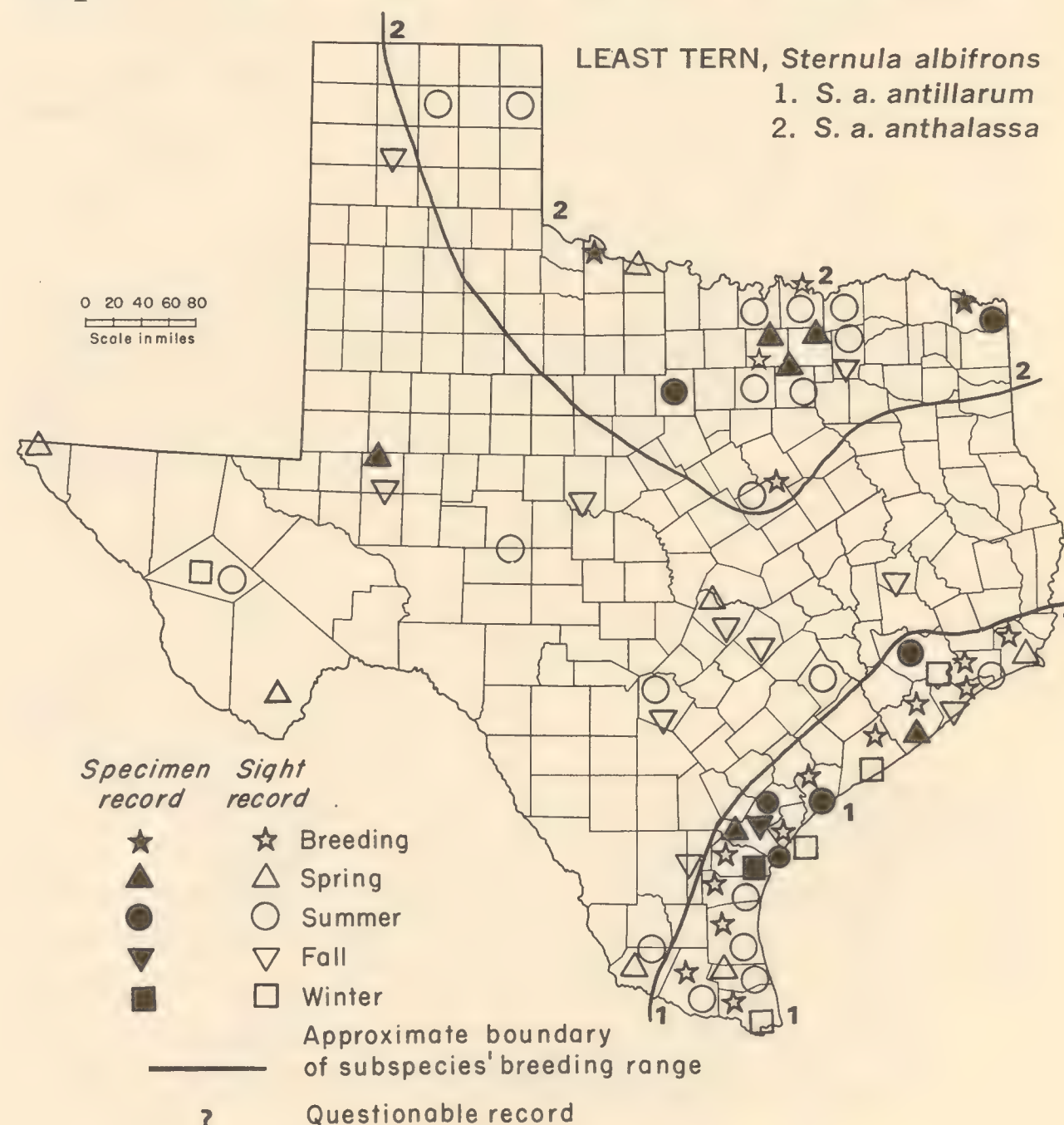
SPECIES ACCOUNT

Sterna albifrons of A.O.U. check-list, 1957 (see Appendix A). A very small, pearl-mantled white tern with white forehead and contrasting black cap; blackish on outer primaries; black-tipped yellow bill (dull brown in fall); yellow legs (dull yellow in fall); short, well-forked tail. Length, 9 in.; wingspan, 19¾; weight, 1½ oz.

RANGE: Locally in most temperate and tropical regions of world. In Western Hemisphere, coastally from c. California to s.w. Mexico and from Massachusetts to British Honduras, West Indies, and n. Venezuela, and inland along large rivers chiefly in central portions of United States. American birds winter chiefly in South America south to coasts of Peru and Brazil; casually north to coasts of Gulf of Mexico.

TEXAS: (See map.) *Breeding:* Early Apr. to early Aug. (eggs, Apr. 9 to July 28) from just above sea level to 1,400 ft., possibly somewhat higher. Common to fairly common along Gulf coast; uncommon to rare and highly local in north central Texas, south to McLennan Co. (eggs located on Brazos River below Waco, June 18, 1932, July 22, 28, 1933, T. F. Smith), where casual; formerly casual in Bowie Co. (eggs, June 20, July 3, 1888, B. T. Gault), and Hidalgo Co. (eggs, found on Lomita Ranch, May, 1877, G. B. Sennett). *Migration:* Mar. 12 to June 11; July 6 to Dec. 17. Very common to common along coast; uncommon to rare in north central Texas south to Fort Worth and Dallas; rare through remainder of eastern three-quarters; casual in Trans-Pecos. *Winter:* Dec. 21 to Feb. 18. Casual along coast from Galveston Bay to mouth of Rio Grande.

HAUNTS AND HABITS: The Least Tern is a largely coastal tern of active habits. Actually it is not quite the smallest tern, since the Damara, *Sterna balaenarum*, of southwestern Africa has an inch shorter wingspan. The Least breeds locally along Gulf beaches, flats, bays, inlets, lagoons, and islands; however, it also nests very intermittently on sandbars of the Red River on the northern border of Texas. In the southeast United States, the present species and the Black Skimmer are usually the last ternlike birds to abandon nesting attempts on mainland shores as these become more and



more cluttered with hordes of shacks, automobiles, motorcycles, cats, dogs, rats, people, and polluted by the wastes of same. Until public use of the beaches at Rockport, Texas, became excessive in recent years, Least Terns were able to adjust to civilization. Sometimes, for example, birds would lay their eggs in heel marks left by the boots of trampling fishermen, instead of excavating their usual saucerlike nests. Least Terns at times appear in loose flocks, even during the breeding season, but individuals are usually seen singly or in small groups. Apparently not as sociable as many other gulls and terns, *Sternula albifrons* less frequently joins large mixed breeding colonies; it does, however, show an affinity for nesting Piping Plovers in the North and Wilson's and Snowy plovers in Texas.

Smallest of the American terns with the quickest wing-beats, the Least is extremely buoyant, swift, and graceful; at times, flight is long sustained and high. Feeding for tiny fish and shrimp is done in the typical hover-plunge manner of terns, but the Least also occasionally skims the water to pick up surface-dwelling creatures. It seems to prefer the air to the ground, although this bird and the Black Tern frequently rest by standing or sitting on sand just above the highest reach of the tide.

A common cry of the Least Tern—uttered mostly by members of a flock on the wing—is a high-pitched, rather musical *zree-eeek*, *zree-eep*, or *zeek*, which suggests jingling sleigh bells. Individuals also repeat sharp *kit's* (also described as *yip* and *keck*). Since this bird is highly migratory, its wee voice is heard in Texas chiefly from mid-April to early October.

CHANGES: Though *Sterna albifrons* appears to be holding its own as a nester in Texas, continued pollution and despoliation of coastal habitats are bound to deter even this common coastal nester. In May and June, 1969, the Cooperative Fish-eating Bird Survey found 2,331 Least Terns on the upper coast, 680 on the central coast, and 300 on the lower coast.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN LEAST TERN, *Sternula albifrons antillarum* Lesson

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Forehead and short superciliary stripe white; crown and nape black with slight metallic gloss; rest of upper surface, including wings and tail, pallid neutral gray, inner webs of outermost tail feathers whitish basally, two outer primaries deep or blackish mouse gray, except for broad white stripe along inner edges except at tip; stripe through eye from bill black; sides of head below eye, sides of neck, and entire lower parts including lining of wing white. Bill chrome yellow, deep chrome, straw yellow, or ocher yellow, but tip usually dull black or dark brown; iris auburn or vandyke brown; legs and feet orange-yellow, buff yellow, ocher yellow, or deep chrome; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but black of crown and lores duller and mixed with white. Bill dull brown; legs and feet dull yellow. *Second winter*: Acquired by complete postnuptial molt. Indistinguishable from adults in winter. *First nuptial*: Acquired by complete prenuptial molt. Very similar to nuptial adults, but usually with some indication of immaturity, such as darker markings on upper parts. *First winter*: Acquired by wear from

juvenal. Similar to juvenal, but upper parts more uniformly gray, with very few or almost no dark subterminal bars on feathers, also without buffy edgings; most of crown white, heavily spotted or streaked with dull black or mouse gray, and with dark brown on anterior lesser wing-coverts around edge of wing. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller; tail shorter; entire crown dull grayish white, feathers edged with pinkish buff or pale cinnamon buff, and with some small narrow shaft streaks of fuscous or deep mouse gray; tail pale gray with broad white edgings; broad dull black stripe through eye; dull black nuchal collar mixed with dull white or dull pale buff; back, scapulars, and tertials broadly edged with dull white, dull buff, dull pale buff, pinkish buff, or pale gray, feathers with subterminal V-shaped bar of hair brown or mouse gray; inner primaries darker than in adult and broadly margined with white; secondaries mostly white; anterior lesser wing-coverts deep mouse gray vermiculated with dull white or dull pale buff, forming bar on wing which extends also along outer edge as far as primary coverts; rest of wing-coverts edged with pale dull buff or dull white. Bill fuscous black or fuscous, but basal half of cutting edges pale orange-yellow; inside of mouth pale orange-yellow; iris dusky drab or deep olive brown; legs and feet rather dull light brown or pale yellow-orange, but webs of toes orange buff, and terminal part of tarsus with soles of toes brownish yellow; claws black. *Natal*: Cinnamon buff with a few small spots of dull black on head, somewhat clouded with fuscous on lower back and rump, or almost pure white with slight buffy tinge and similar markings; lower parts white sometimes tinged with buff on throat. Bill dull yellow, tipped with brown; legs and feet pale yellow.

MEASUREMENTS: *Adult male*: Wing, 163.1–178.1 (average, 168.1) mm.; tail, 70.1–93.0 (81.3); bill (exposed culmen), 25.9–31.0 (28.7); height of bill at base, 7.1–8.1 (7.6); tarsus, 14.0–15.5 (14.5); middle toe without claw, 11.4–13.5 (12.7). *Adult female*: Wing, 160.0–167.1 (162.8); tail, 61.0–85.6 (72.7); bill, 25.4–29.9 (27.4); height of bill, 6.6–8.1 (7.6); tarsus, 14.0–16.0 (14.7); middle toe, 10.9–13.0 (12.2).

RANGE: Locally on coasts and coastal islands from Massachusetts to Florida and Texas; also Bermuda, West Indies, Grass Cay (British Honduras), small islands off coast of Venezuela, and Trinidad. Winters coastally from e. Central America to Brazil.

TEXAS: *Breeding*: Altitudinal range, near sea level to 200 ft. Collected along coast northeast to Harris, southwest to Cameron cos. Common.

NESTING: *Nest*: Regularly in colonies; on sandy or clay flats of sea beaches, or islands, particularly if strewn with pebbles or shells, usually on bare sandy or gravelly shingle; on ground, in slight hollow, in some cases without nest material, sometimes ornamented with bits of shell, wood, or stone. *Eggs*: 1–4, usually 2–3; ovate to short ovate; not glossy; light bluish green, pale olive buff, cartridge buff, or dull drab; irregularly spotted and finely dotted with various shades of brown, often in wreath about larger end, and with shell markings of lavender or shades of lavender gray; average size, 31.0 × 23.6 mm.

INTERIOR LEAST TERN, *Sternula albifrons anthalassa* (Burleigh and Lowery)

Sterna albifrons anthalassos of A.O.U. check-list, 1957.

DESCRIPTION: *Adults, nuptial plumage*: Similar to *S. a. antillarum*, but upper surface uniformly darker; lower parts somewhat more washed with grayish; and more often three outer primaries instead of two of darker color.

MEASUREMENTS: *Adult male*: Wing, 166.1–176.0 (average, 169.4) mm.; tail, 70.6–92.5 (82.3); bill (exposed culmen), 26.9–28.9 (28.2); height of bill at base, 6.9–7.6 (7.4); tarsus, 14.0–16.3 (15.5); middle toe without claw, 11.4–12.4 (11.9). *Adult female*: Wing, 161.0–168.9 (164.8); tail, 67.6–83.1 (75.7); bill, 23.9–26.9 (25.7); height of bill, 6.1–7.1 (6.6); tarsus, 14.5–16.5 (15.7); middle toe, 10.4–12.2 (11.4).

RANGE: Along river systems from s.e. South Dakota and n.

Iowa, south to n. Texas and n.w. Tennessee. Winters coastally from s. Texas to Oaxaca.

TEXAS: *Breeding*: Altitudinal range, 275 to 1,400 ft. Collected inland in Wilbarger (eggs), Palo Pinto (nesting unconfirmed), and Bowie cos. Uncommon and very local. *Migration*: Collected north to Denton and Collin, south to Refugio and Cameron, west to Midland (probably this race) cos. *Winter*: One specimen: Nueces Co., near mouth of Nueces River (Jan. 8, 1886, J. M. Priour).

NESTING: Usually in small colonies on sandy flats or bars along rivers, otherwise similar to that of *S. a. antillarum*.

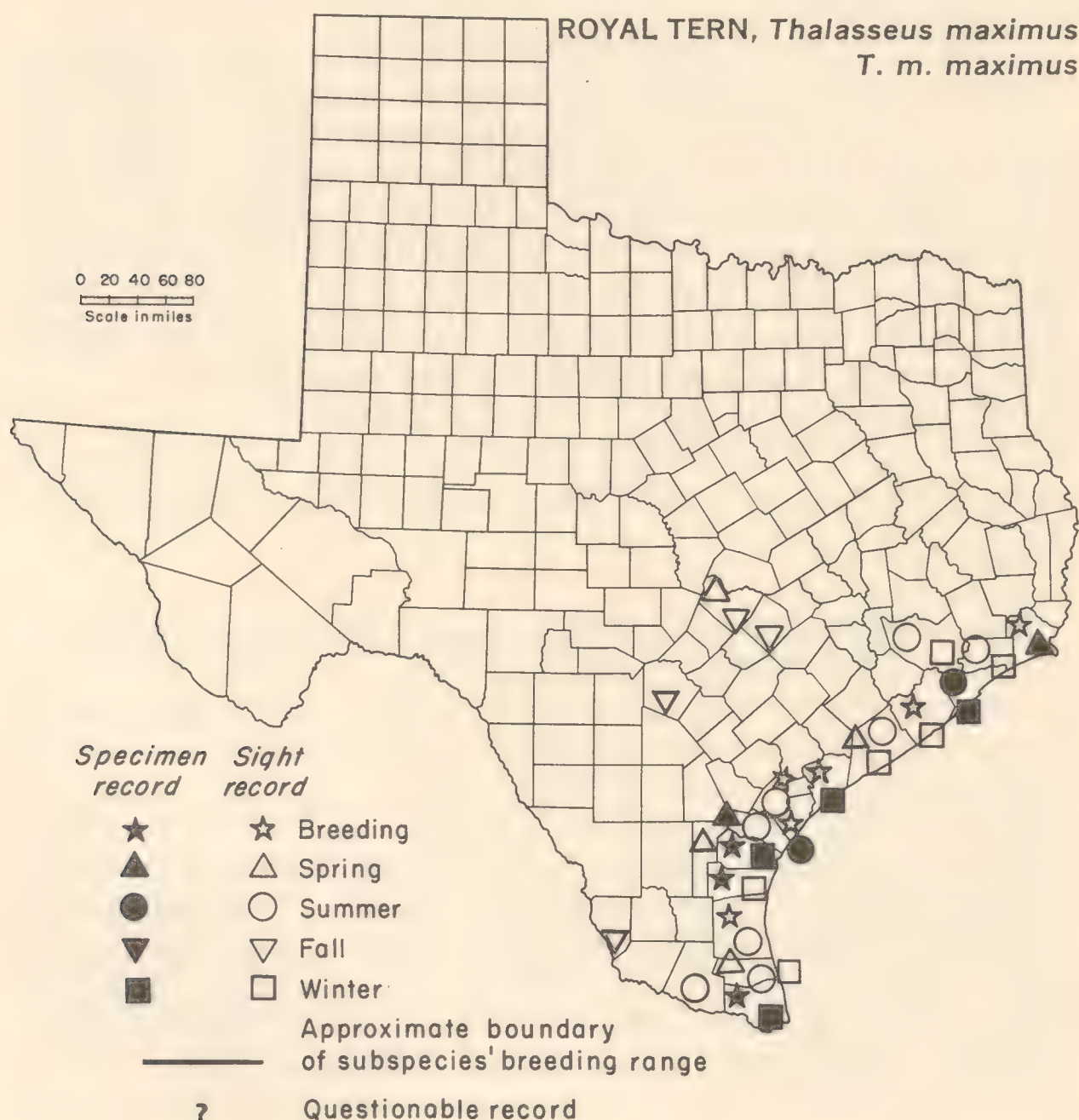
ROYAL TERN, *Thalasseus maximus* (Boddaert)

SPECIES ACCOUNT

A large, streamlined, pearl-mantled white tern with rather slender orange bill and well-forked tail; black nuptial cap (worn briefly) and occipital crest; black legs and feet; underside of primaries pale gray, blackish only at extreme tips of feathers. Length, 19¾ in.; wingspan, 3¾ ft.; weight, 14½ oz.

RANGE: Locally on coasts and associated islands of extreme s. California, Baja California, and n.w. Mexico (including Tres Mariás Islands), Yucatán, Texas and Louisiana, Georgia (formerly Florida) to Maryland, West Indies, and Isla Noronquí off n. Venezuela; also coast of west Africa. American birds winter coastally from c. California to Peru, and from North Carolina and Gulf of Mexico to Argentina.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, late Mar. to late July (eggs, Apr. 8 to June 18; young in nest to July 22) just above sea level. Very common to fairly common along Gulf coast, nesting locally. *Vagrant*: Wanders inland very irregularly, prompted chiefly by coastal warm-weather disturbances; has reached Falcon Reservoir, San Antonio, and Austin, where casual.



HAUNTS AND HABITS: The Royal Tern is more gracefully proportioned than the comparatively gross, clumsy-appearing Caspian, only other large Texas tern. On the Gulf coast, the Royal resides about bays, lagoons, jetties, and islands, rarely venturing inland any distance; it is not truly pelagic, but some individuals fly out over the Gulf to the line where sea green becomes sea blue. It is seen singly, in pairs, or in flocks about open beaches and mud flats when the tide is out, or sitting atop pier pilings. On shores, this bird assembles into companies, often associating with groups of gulls and other terns, especially the Sandwich, as well as Black Skimmers.

The Royal travels with steady wing-beats, often circling at great heights. It is less buoyant than smaller terns, but appears more lithe in flight than the larger Caspian because of its slender bill and body, long, narrow, swept-back wings, and deeply forked tail. When fishing, it moves at a moderate height above the water, hovers, then plunges for small fish—usually less than four inches long—such as mullet, menhaden, anchovies, croakers, also a few shrimp and crabs. This bird, with small and weak webbed feet, is a poor swimmer and seldom, if ever, alights on the water.

Royal Terns, especially when disturbed on the breeding grounds, squawk loud *keer's* which are higher pitched than the Caspian's call; also *kaak's* or *kowk's*. Another vocalization, given on the wing, is a rolling *tourrrreee*, often made by an individual in pursuit of another Royal with a fish in its beak. The Royal, like other terns, is more vocal in the warmer months.

CHANGES: Apparently, *Thalasseus maximus* is the most numerous and evenly distributed nesting tern in Texas. In May and June, 1969, the Cooperative Fish-eating Bird Survey found 2,649 Royals on the upper coast, 5,420 on the central coast, and 2,500 on the lower coast. Colonies were found in practically every major bay.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN ROYAL TERN, *Thalasseus maximus maximus* (Boddaert)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Pileum, occipital crest, and upper half of lores black with slight greenish or bluish metallic sheen; hindneck white; back, scapulars, rump, wing-coverts, and exposed surface of wings pallid neutral gray; upper tail-coverts white; tail white, slightly washed with pallid neutral gray; six outer primaries, except for broad white stripe on inner webs, deep mouse gray, but outer webs of feathers hoary gray, the shafts white; inner primaries gray like wing-coverts, inner webs edged with white; secondaries mostly white, with middle portions of outer webs of outermost feathers neutral gray. Bill cadmium orange or orange-red, but paler at tip; edges of eyelids black; iris vandyke brown; legs and feet black or dark brown, but soles of toes dull yellow. *Adults, postnuptial*: Acquired by partial postnuptial molt. Like nuptial adults, but forehead, anterior part of lores, and fore part of crown white. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but whole crown white, sometimes slightly streaked with dull black, black of occipital crest also streaked or spotted with white. Bill orange-red or orange; iris dark brown; legs and feet black. *Second*

winter: Acquired by complete postnuptial molt. Identical with adults in winter. *First nuptial*: Acquired by complete prenuptial molt. Like nuptial adults, but pileum not so completely black. *First winter*: Acquired by partial postjuvinal molt. Similar to first nuptial male and female, but wings and tail retained from juvenal. *Juvenal*: Acquired by complete postnatal molt. Like adults in winter, but bill smaller; upper parts spotted with hair brown or mouse gray, clouded with darker gray, and somewhat mixed with dull white; tail hair brown or mouse gray terminally, basally neutral gray on outer webs, white or grayish white on inner webs of feathers, all rectrices tipped with white; secondaries largely mouse gray or hair brown; wing-coverts clouded with neutral gray, particularly greater coverts which are mostly neutral gray; anterior wing-coverts neutral gray or deep neutral gray, forming broad dark band on forewing. Bill reddish yellow, tip light yellow. *Natal (plain buff phase)*: Upper parts pale cream buff, pale pinkish buff, or light pinkish cinnamon, very sparingly spotted and narrowly streaked, except on forehead, with dull black, or almost immaculate, texture of feathers above and below somewhat hairlike; lower parts white or buffy white. Bill and feet pale. *Natal (mottled buff phase)*: Similar to plain buff phase, but upper parts, head, throat, and flanks conspicuously spotted with black. *Natal (blackish phase)*: Similar to other phases, but still more extensively marked with black; forehead and lores black. Tip of bill black.

MEASUREMENTS: *Adult male*: Wing, 359.9–382.0 (average, 371.9) mm.; tail, 167.1–192.0 (181.3); bill (exposed culmen), 58.9–68.1 (64.3); height of bill at base, 18.0–19.6 (18.5); tarsus, 29.4–34.5 (31.8); middle toe without claw, 24.9–27.9 (26.7). *Adult female*: Wing, 344.9–390.9 (371.3); tail, 155.9–189.0 (172.7); bill, 57.4–67.1 (62.7); height of bill, 17.5–19.0 (18.3); tarsus, 29.9–34.5 (32.8); middle toe, 24.4–28.4 (27.2).

RANGE: Identical with species' range with exception of West Africa.

TEXAS: *Resident* (fewer in winter): Collected along coast northeast to Jefferson, southwest to Cameron cos.

NESTING: *Nest*: Normally in colonies, often large; on sandy islands or bars along seacoasts; in slight depression of sand, gravel, or shell-strewn shingle, without lining or nest material. *Eggs*: 1–4, usually 1 or 2; elongate ovate, also ovate, elliptical ovate, or even cylindrical ovate; white, pale dull yellow, or pale green, with small dots and occasional blotches of various shades of dark brown and black; also shell markings of lavender gray or pale violet gray, but sometimes entirely unmarked; average size, 63.0 × 44.4 mm.

ELEGANT TERN, *Thalasseus elegans* (Gambel)

SPECIES ACCOUNT

Closely resembles larger Royal Tern, but bill decidedly slimmer, proportionately longer, and slightly downcurved; crest longer. Birds in high breeding plumage tinged below with pink. Length, 17 in.; wing-span, 3½ ft.

RANGE: Chiefly on coasts and offshore islands of Baja California, but also locally along remainder of Pacific Mexico; recently extreme s. California (San Diego Bay). Winters from Peru to Chile, north casually to El Salvador. Postbreeding birds wander north irregularly to San Francisco Bay.

TEXAS: *Accidental*: One specimen: Nueces Co., Corpus Christi (immature male, July 25, 1889, F. B. Armstrong). One sighting: Brazoria Co., Bryan Beach near Freeport (July 17, 24, 30, 1965, Pat Ellis, J. P. O'Neill, H. L. Patten, Mr. and Mrs. J. B. Strickling).

Future observers of Elegant Terns in Texas should

take great care to distinguish this bird from the Cayenne Tern, *Thalasseus eurygnatha*, of Caribbean coasts, which seabird would seem more likely to stray (perhaps assisted by hurricanes) to Texas than the Pacific *T. elegans*. The Cayenne is the same size; the nuptial adult is distinguished by its pale yellow bill; in nonbreeding plumage, the two forms probably cannot be separated in the field.

HAUNTS AND HABITS: The trim Elegant Tern is well named, except that its slightly drooping bill mars its profile a bit. In contrast to many other terns, this one is highly restricted in distribution: As a breeder it is essentially limited to Baja California. The best studied colony is at Isla Raza, an islet near Isla Tiburón in the Gulf of California. Here a large colony has been able to raise some young by carrying on a running battle with Heermann's Gulls, which eagerly devour eggs and young day and night. Each tern lays a single (usually), beautifully spotted egg in a saucer in the sand. Nesting or resting, the Elegant seems to have an affinity for sandy sea beaches; the two individuals found in Texas were relaxing on sand.

Flight is performed in the graceful and buoyant manner of most terns; likewise, when foraging, the Elegant conforms with the majority of Sterninae by plunging from air into water (apparently always marine with the present species), but not swimming. Postnuptial wanderers along the California coast dive for small bait fish and squids usually a bit offshore but not completely out of sight of land. In addition to perching above surf on sand beaches, Elegant Terns also rest on floating planks or other debris.

Voice of *Thalasseus elegans* is a nasal *karreek*, *karreek* like a low-pitched Least Tern; this vocalization is very different from that of the similar-in-appearance Royal, whose calls resemble those of a high-pitched Caspian Tern (R. Pyle and A. Small). The Elegant Tern is extremely noisy about its nesting colonies, but only very moderately so in the nonbreeding season.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Pileum, including upper half of lores, with occiput and crest, black; hindneck, upper tail-coverts, tail, sides of head and of neck, and entire lower parts white; lower parts in life tinged with eosine pink; back, rump, scapulars, and upper surface of wings pallid neutral gray, three outer primaries deep mouse gray, shafts white, inner webs except for tips, white, exposed surface hoary gray, fourth and fifth primaries similar but paler; secondaries mostly white, outer webs of more outer ones neutral gray, broadly tipped with white. Bill red, tip salmon pink; iris dark brown; legs and feet black, soles of toes slightly yellowish. *Adults, postnuptial*: Acquired by partial postnuptial molt. Like nuptial adults, but forehead and anterior part of lores white. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults, but whole crown more or less white, though sometimes streaked with black. Bill orange, tip and cutting edges yellow. *First nuptial*: Acquired by probably complete prenuptial molt. Very similar to nuptial adults. *First winter*: Acquired by partial postjuvinal molt. Similar to first nuptial male and female, but with wings and tail of juvenal. *Juvenal*: Acquired by complete postnatal molt. Like adults in winter, but lores finely streaked and top of head broadly streaked and spotted with fuscous; remainder of upper parts

with large spots of fuscous and hair brown; primaries mostly fuscous or brownish slate; secondaries hair brown or deep mouse gray, inner webs and tips dull white; tertials similar, anterior lesser wing-coverts mostly dark hair brown or deep mouse gray, remainder of wing-coverts hair brown or mouse gray, with edgings of white or buffy white; tail hair brown, basally dull neutral gray, inner webs dull white, all rectrices tipped with white.

MEASUREMENTS: *Adult male*: Wing, (average, 310.1) mm.; tail, 149.1–170.9 (159.8); bill (exposed culmen), 61.5–65.5 (64.0); height of bill at base, (13.7); tarsus, 28.9–31.5 (30.2); middle toe without claw, 19.8–22.6 (21.4). *Adult female*: Wing, 310.1–322.1 (315.0); tail, 165.1–181.1 (170.7); bill, 61.0–68.1 (63.2); height of bill, (13.5); tarsus, 28.9–32.0 (30.5); middle toe, 20.1–22.1 (21.1).

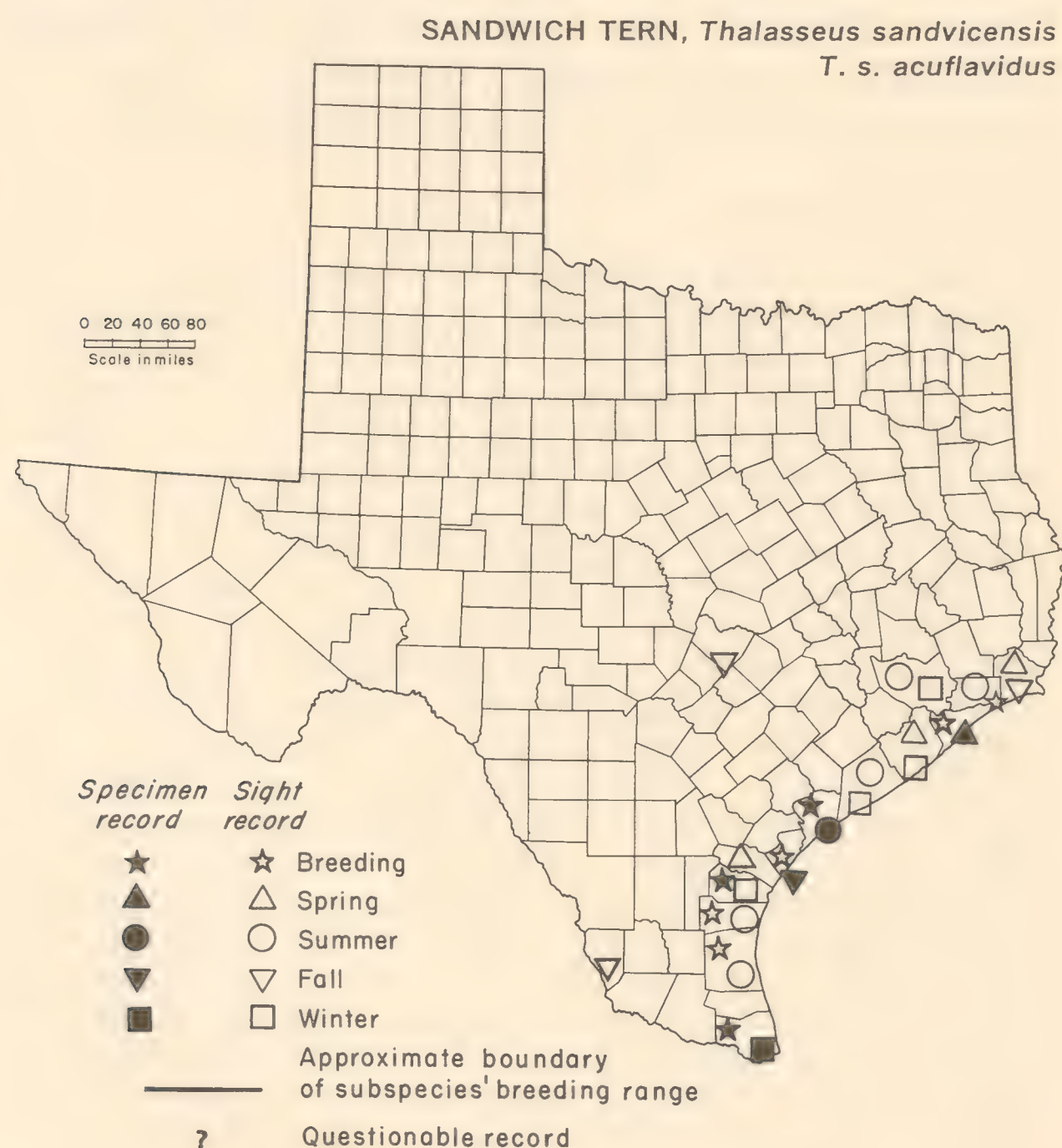
TEXAS: *Accidental*: One specimen (see species account).

SANDWICH TERN, *Thalasseus sandvicensis* (Latham)

SPECIES ACCOUNT

Also known as Yellow-nibbed Tern and Cabot's Tern (American birds). A trim, pale-gray-mantled white tern with long, slender, yellow-tipped black bill and deeply forked tail; black cap (worn briefly early in breeding season; mostly white thereafter) and slight crest (often spotted with white in winter); black legs and feet. Length, 15 in.; wingspan, 34; weight, 6½ oz.

RANGE: Very locally in s. North America, Europe, w. Asia, and n.w. Africa; in North America, locally along Atlantic seaboard from s. Atlantic and Gulf states to Yucatán and British Honduras, also Bahamas. Winters into Southern Hemisphere; in New World irregularly from s. Atlantic Florida and n. Gulf coast locally to Argentina, and very locally on Pacific coast in Central America, also West Indies.



TEXAS: (See map.) *Breeding*: Mid-Apr. to mid-July (eggs, Apr. 25 to July 2) just above sea level. Common to uncommon from Mar. to Oct. along Gulf coast, nesting locally from San Antonio Bay south to mouth of Rio Grande, irregularly north to Galveston Bay. *Winter*: Mid-Nov. to mid-Mar. Locally uncommon to scarce on central coast; rare along remainder of Gulf coast. *Vagrant*: Casual inland, where sighted after hurricanes at Austin (2 on Sept. 12, 1961, G. F. Oatman, Jr., J. L. Rowlett, Rose Ann Rowlett) and Falcon Reservoir (2 on Sept. 22, 1967, Mr. and Mrs. L. T. Adams).

HAUNTS AND HABITS: In Texas, the Sandwich Tern—whose yellow bill tip is seen much better against water than against sky—appears about Gulf jetties, either coursing over the breakers or resting on the beach. It is often in company with Royal Terns, and like that species, is inclined to forage farther from shore than do most coastal terns. Occasionally one or two will accompany an individual Sooty Tern, a true pelagic, out to the threshold of deep blue sea. Although its numbers are fewer and it is more localized as a breeder than the Royal, the Sandwich, like its sometimes companion, is gregarious, and during the breeding season forms colonies in proximity to nesting Royals.

Flight, swift and buoyant, is characteristic of terns, and the Sandwich is another of the Sterninae which merits the name “sea swallow.” Leaving quiet bays, inlets, and estuaries for the most part to smaller terns, it often fishes in rough waters of the open Gulf, where it dives vigorously for small mullet, menhaden, anchovies, other small fish, shrimp, and squid. On land it seldom walks about, but is usually seen sitting in a row with its fellows, their bills turned into the breeze, should there be any.

Call of the Sandwich Tern is a grating *kirr-ick* which is higher pitched than the Gullbill's somewhat similar *kay-weck*; also heard is a loud shrill *cree*. When feeding at any time of the year, or alarmed in the vicinity of the nesting colony, the species is quite vociferous.

CHANGES: Although localized as a nester, the Sandwich Tern appears to be maintaining a viable population in Texas. In May and June, 1969, the Cooperative Fish-eating Bird Survey found 26 on the upper coast, 3,220 on the central coast, and 2,050 on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

CABOT'S SANDWICH TERN, *Thalasseus sandvicensis acufavidus* (Cabot)

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt: Pileum, occipital crest, and upper half of lores black; hindneck, upper tail-coverts, tail, sides of head below eyes, sides of neck, lining of wing, and entire lower parts white; in life lower surface suffused with eosine pink; back, scapulars, rump, and upper surface of wings pallid neutral gray; four outer primaries deep or dark mouse gray, outer webs hoary gray like back, shafts white, inner webs with broad stripe of white except at tips; secondaries mostly white except for basal portions of outer webs and terminal portion of outer webs of some of inner feathers. Bill black, tip light yellow; inside of mouth dark blue; iris dark brown; legs and feet black, soles of toes yellow. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial

adults, but forehead and crown white, the latter narrowly streaked with black; occipital crest somewhat brownish; tail shorter and somewhat grayish terminally. Tip of bill of paler yellow and of less extent. *Adults, postnuptial*: Acquired by partial postnuptial molt. Like nuptial adults, but forehead and anterior part of lores white. *First nuptial*: Acquired by complete prenuptial molt. Like nuptial adults. *First winter*: Acquired by partial postjuvenile molt. Similar to adults in winter, but with dark band on anterior lesser wing-coverts; pileum, particularly occiput, with much more white; mantle less purely gray and somewhat mottled with fuscous. Bill shorter, and partly light colored; wings and tail as in juvenal. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but top of head much spotted and streaked with dull black or fuscous black; sides of head mostly dull black, slightly mixed with dull white; upper parts chiefly pallid neutral gray, everywhere boldly spotted or irregularly barred with fuscous, including lesser wing-coverts, anterior lesser wing-coverts mostly of this color, forming distinct bar on wing; tail dull pale gray, rectrices with fuscous tips mottled with grayish white; upper tail-coverts and nape paler than rest of upper surface; primaries chaetura black, shading to hair brown on innermost feathers, and with broad edge on inner webs dull white or grayish white, shafts white, also all but outer primaries broadly tipped with grayish or buffy white; exposed surface of secondaries pale gray like rest of wing, but inner webs mostly white; lower surface white. Bill brownish black, slightly paler at tip; iris dark brown; legs and feet black. *Natal*: Upper parts white with a few hair brown spots posteriorly; lower parts white. Bill and feet light, rather yellowish flesh color.

MEASUREMENTS: *Adult male*: Wing, 270.0–302.0 (average, 288.5) mm.; tail, 117.1–136.9 (125.2); bill (exposed culmen), 51.8–56.4 (54.1); height of bill at base, 11.9–13.5 (12.7); tarsus, 25.9–27.7 (26.9); middle toe without claw, 18.3–20.1 (19.0). *Adult female*: Wing, 273.0–289.1 (281.7); tail, 116.1–124.0 (119.9); bill, 47.5–53.6 (50.5); height of bill, 11.4–13.0 (12.4); tarsus, 24.9–27.4 (26.2); middle toe, 18.0–20.1 (18.8).

RANGE: Identical with species' range in New World.

TEXAS: *Breeding*: Collected along coast northeast to Galveston, southwest to Cameron cos. *Winter*: One specimen: Cameron Co., lower Rio Grande (Jan. 1, 1889, F. B. Armstrong).

NESTING: *Nest*: Commonly in colonies; on sandy, low, and rather flat sea islands; often with Royal Terns; on sand or in slight depression, without nest materials. *Eggs*: 1–3, usually 1 or 2; ovate to elongate ovate; smooth but not glossy; white, cream color, pale cinnamon pink, buff, and pale olive buff; variously marked with black and numerous shades of brown, with shell markings of pale lavender gray; average size, 51.5 × 36.1 mm.

CASPIAN TERN, *Hydroprogne caspia* (Pallas)

SPECIES ACCOUNT

A large, gull-like tern resembling smaller, slimmer Royal, but has heavier blood red bill; black or blackish forehead year-round; and only slightly forked tail; in flight, broader wings with underside of primaries decidedly blackish instead of gray. Length, 21¼ in.; wingspan, 4¼ ft.; weight, 1¼ lbs.

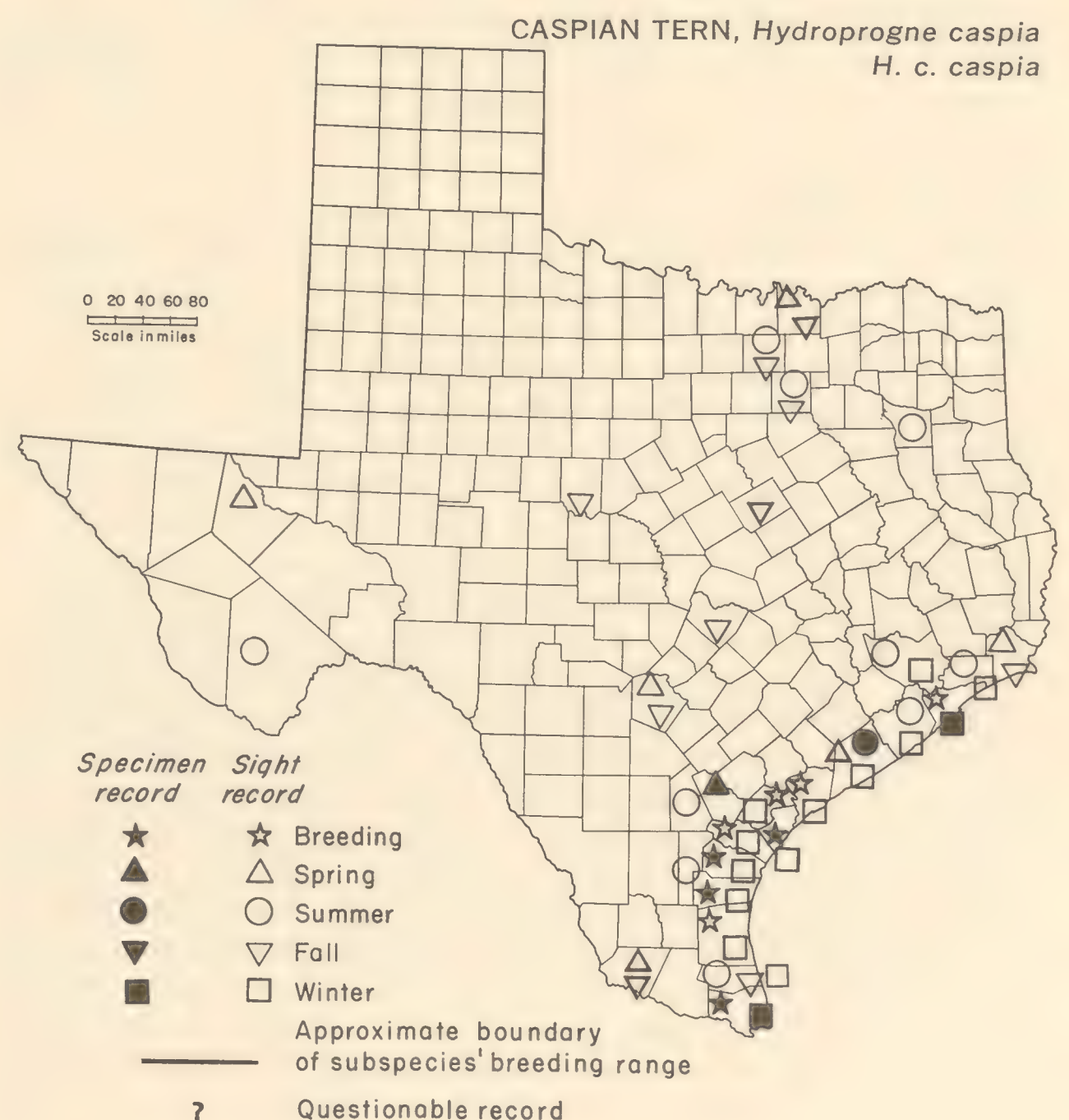
RANGE: Locally in Eastern Hemisphere and North America; in North America, widely scattered, chiefly on lakes, south to Baja California, Sinaloa, Utah, Wyoming, and Great Lakes region, also coastally in Texas, Louisiana, South Carolina, and Virginia. In winter, northern birds wander widely, often reaching Southern Hemisphere; in New World, mainly coastally from c. California locally to Guatemala and from s.e. United

States locally to Honduras and n. South America, also Greater Antilles.

TEXAS: (See map.) *Resident*: Breeds, mid-Mar. to mid-July (eggs, Mar. 25 to June 18; young in nest to July 7) just above sea level. Common to scarce along Gulf coast, nesting locally. *Vagrant*: Wanders inland irregularly—rarely over 100 mi. from coast—as far as north central Texas; casual in Trans-Pecos.

HAUNTS AND HABITS: The Caspian, largest of the terns, rivals the Herring Gull in size, but its black cap, red bill (often pointing downward as the bird flies), and forked tail distinguish it. In Texas, it seeks less developed and polluted segments of the coast, nesting principally on barren spoil islands or shell beaches free of vegetation. This bird is more often seen a bit inland, in marshes and along rivers, than is the other big Texas tern, the Royal. At times, the Caspian forms loose flocks, particularly on the breeding grounds and over good fishing waters, but is nowadays (1970's) most frequently observed singly, in pairs, or in groups of a few individuals.

Flight of the Caspian is gull-like, strong, and swift—not so airy and light as that of smaller terns. On long, broad wings it often soars, at times vanishing into the blue sky. To travel any distance, this powerful bird flies high in the air with bill extended forward, even moving with apparent ease into a headwind. Usually well offshore, a foraging Caspian, with down-turned bill, hovers several yards above the water, then dives headfirst—often completely submerging—for medium-small fish, such as mullet, a few shrimp, and other near-the-surface aquatic life. Between meals, the shy and wary bird rests for long periods on an isolated sandbar or coastal flat; it is at this time that individuals are likely to gather in flocks.



The cry of the Caspian Tern, distinctive among Sterninae, is a low, hoarse, croaking *kraa-uh* or *karr*; also heard are low repeated *kak*'s. Calls are more frequent in warmer months, but occasionally sound in winter, especially where fishing is good.

CHANGES: In May and June, 1969, the Cooperative Fish-eating Bird Survey found 12 Caspian Terns on the upper coast, 400 on the central coast, and 250 on the lower coast. Compilers of the census estimated the total Texas summer population of *H. caspia* to be less than 800 birds.

Though apparently no comparable census figures exist for previous years, reports gathered by H. C. Oberholser suggest that the species was more numerous during the first half of the twentieth century, at least on the central and lower coasts. For example, on Bird Island, Calhoun County (central coast), R. W. Quillin found 250 nesting pairs on May 17, 1924; on Shell Island (same county), J. J. Carroll observed "several hundred" nests with eggs and young, May 2-3, 1928; on a mud dump in Brazos Santiago Pass, Cameron County (lower coast), a large nesting colony of several hundred birds was found in May of both 1927 and 1928 by J. J. Carroll; on Three Islands (same county), Oberholser counted 218 individual Caspians on August 28, 1937.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN CASPIAN TERN, *Hydroprogne caspia caspia* (Pallas)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage*: Acquired by complete prenuptial molt. Upper half of lores and pileum extending down to include eyes black with greenish sheen, and with small spot of white just below each eye; remainder of upper surface, including wing-coverts and scapulars, pallid neutral gray, paling into almost white on hindneck, and to white on upper tail-coverts; tail grayish white; primaries, except innermost, dark mouse gray to hair brown, outer webs hoary grayish, basal part of inner webs paler, shafts yellowish white; remainder of plumage white. Bill dark coral red, scarlet, subterminally tinged with brown, tip rufous, orange, or yellow; inside of mouth grenadine red; eye-ring black; iris auburn or hazel; legs and feet black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but black of pileum much streaked with white. Bill orange-red, tip lighter. *Second winter*: Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adults, but pileum and lores more streaked with black; remainder of upper parts duller; tail duller, as are primaries and secondaries. *First winter*: Acquired by partial postjuvinal molt. Similar to juvenal, but bill larger; head with little or no brownish intermixture, upper parts with little or no buff, and dark markings of upper surface smaller and fewer. *Juvenal*: Acquired by complete postnatal molt. Similar to adults in winter, but bill smaller; tail feathers less sharply pointed; pileum somewhat mixed with light brown as well as white; mantle and upper tail-coverts much washed with dull buff, and with numerous subterminal spots or bars of fuscous; tail neutral gray, basally white, but toward ends of feathers barred with hair brown or chaetura black, and pale buff and dull white. Bill dull orange or orange-red, but dark brown near tip; legs and feet brown or dull black. *Natal (mottled phase)*: Upper parts dark grayish buff, vinaceous buff, or grayish white, much mottled with hair brown or light

fuscous, particularly on posterior portion; lower parts white, but throat slightly tinged with pale gray. Bill, legs, and feet dull orange; tip of bill dull black. *Natal (plain phase)*: Similar to mottled phase, but upper parts with no dark markings.

MEASUREMENTS: *Adult male*: Wing, 390.9-433.1 (average, 405.1) mm.; tail, 126.0-152.9 (140.2); bill (exposed culmen), 65.0-78.5 (70.9); height of bill at base, 21.1-24.9 (22.9); tarsus, 45.5-50.0 (47.3); middle toe without claw, 29.9-35.1 (33.3). *Adult female*: Wing, 390.1-422.9 (406.1); tail, 136.9-145.0 (140.2); bill, 63.5-70.1 (67.3); height of bill, 20.1-23.9 (21.6); tarsus, 41.9-48.5 (45.5); middle toe, 29.9-34.0 (31.8).

RANGE: Identical to species' range with exception of Australasian region.

TEXAS: *Resident*: Collected along coast northeast to Galveston, southwest to Cameron cos. *Vagrant*: One inland specimen: Bee Co., Beeville (Mar. 13, 1893, G. G. Cantwell).

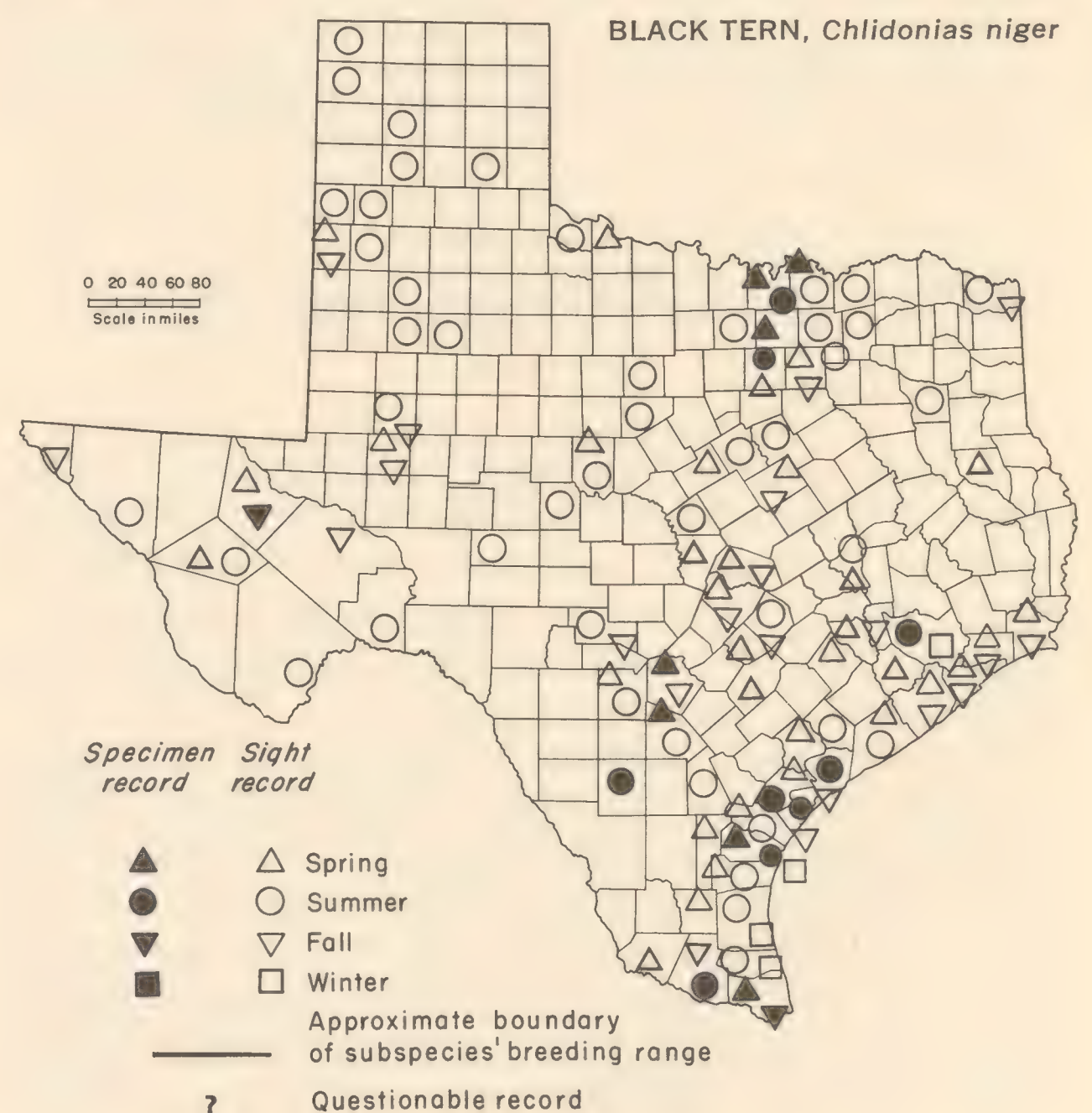
NESTING: *Nest*: Normally in colonies; on sandy or gravelly coastal islands, or mainland, also (outside of Texas) on rocky shores of interior lakes; in depression of sand or gravel, or in dead vegetation; sometimes with no nest material, but at other times well built of reeds, moss, and other vegetation, and decorated with shells or feathers. *Eggs*: 1-4, usually 2; ovate to elliptical ovate; pale buff or greenish buff; with sparse spots of various shades of brown and gray, and shell markings of pale violet gray; average size, 64.5 × 45.0 mm.

BLACK TERN, *Chlidonias niger* (Linnaeus)

SPECIES ACCOUNT

A small, dark-gray-mantled tern with short, well-notched gray tail; white wing-lining (may appear silvery), crissum. *Nuptial*: black head, neck, under parts. *Fall*: mainly white head and under parts; blackish restricted to areas about eye, ear, and back of head. Length, 9¾ in.; wingspan, 23¾; weight, 2¾ oz.

RANGE: Interior temperate North America, c. and s. Europe, and w. Asia; in North America locally from British Columbia to New Brunswick, south to California, Kansas, and w. New York. North American non-



breeders occur in summer irregularly south to Panama and n. Gulf coast. Winters south to Southern Hemisphere; in New World coastally, chiefly from Panama to Peru (casually c. Chile) and Surinam.

TEXAS: (See map.) *Migration*: Late Apr. to mid-June; late July to mid-Oct. (extremes: Mar. 8, early July; early July, Dec. 30). Abundant (some years) to fairly common in most parts; scarce or lacking in desert areas.

HAUNTS AND HABITS: The Black Tern, black only during the breeding season, nests widely across flat marsh country of cool temperate North America. In small, loose colonies about sloughs, lakes, swamps, and other wet inland situations, the bird secludes its flimsy nest typically amid piles of dead, rotting reeds in standing water. Individuals generally move through Texas in all months except January, February, and March. Inland, this leisurely migrant frequents freshwater lakes, marshes, and rivers, particularly their sandbars, and it is attracted to rice and other cultivated fields, where it courses back and forth on airy wings at almost any time of day. It also passes over saltgrass prairies and Gulf waves. Although less densely gregarious than some other species, this tern does gather in detached flocks, but single birds are frequently seen.

In flight, the swift, tireless Black Tern is at times wildly erratic and butterflylike—especially as it darts after a dragonfly. This highly insectivorous tern beats about over marshes or ponds as it picks aquatic insects from the water's surface or hovers before tall, waving reeds to glean crickets, beetles, grasshoppers, other insects, and spiders; it also snatches a quantity of flies, mosquitoes, moths, and other winged insects from the air, in the process appearing like a nighthawk or flycatcher. Along the Gulf coast, as at the Port Aransas jetties (breakwater), this species eats more orthodox tern food—tiny fish. When on the ground the bird usually does not walk about much.

On the wing, the Black Tern utters a sharp *kik*, *keek*, or *klea*. A shrill prolonged *kreek* issues when the bird confronts nest intruders; one must travel north of Texas to hear the *kreek*.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN BLACK TERN, *Chlidonias niger surinamensis* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage*: Attained by complete prenuptial molt. Pileum and hindneck dull black, sometimes with slight gloss; back and scapulars deep neutral gray; remainder of upper surface, including wings, neutral gray, primaries, except for exposed surface in closed wing, fuscous or dark hair brown, shafts brownish white or pale brown, basal portion and inner edge of inner webs of feathers paler; crissum white; remainder of lower surface fuscous to fuscous black; anterior edge of wing, including anterior lesser coverts, white and forming short bar on anterior edge of inner part of wing; lining of wing white. Bill black, suffused with deep red; corner of mouth purplish lake red, inside of mouth and tongue light orange-red, rufous, lavender pink, or pale salmon color; iris

vandyke brown or hazel; legs and feet orange-red, dark bay, dark purple, reddish brown, or reddish black; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Head, neck, and lower surface white, but dark area involving orbital and auricular regions slate black, and occiput and upper part of nape hair brown, mixed with dull white; remainder of hindneck white, and upper surface as in nuptial adults, but gray decidedly paler. *Second nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adults. *Second winter*: Acquired by complete postnuptial molt. Similar to adults in winter, but averaging darker; anterior lesser wing-coverts of decidedly darker gray than remainder and forming dark bar on anterior edge of wing. *First nuptial*: Acquired by nearly complete prenuptial molt. Similar to second winter male and female, except for scattered wing-coverts and body feathers remaining from juvenal and scattered blackish feathers on lower surface. Bill black; iris vandyke brown; legs and feet brownish black; claws black. *First winter*: Attained by wear and partial postjuvenal molt. Like first nuptial male and female, but upper parts averaging darker, much more brownish, including wing-coverts, and without blackish feathers below; similar to adults in winter, but bill shorter; tail less deeply forked; and upper parts more brownish. *Juvenal*: Acquired by complete postnatal molt. Similar to first winter male and female, but upper parts much edged with wood brown or hair brown; wing-coverts and upper tail-coverts obscurely margined with pale buff. Similar to adults in winter, but upper parts, particularly back, scapulars, and tertials, edged with wood brown or hair brown; anterior wing-coverts dark gray; remainder of wing-coverts and upper tail-coverts slightly and obscurely edged with dull pale buff, hair brown, or buffy white; sides and flanks washed with pale gray; sides of breast dull neutral gray washed with buff. Bill black or brownish black, but base of mandible seal brown, flesh color, or tinged with red; inside of mouth yellow, eye-ring black; iris prout brown; legs and feet light brown, brownish black, brownish flesh color, or isabella color; claws black.

MEASUREMENTS: *Adult male*: Wing, 192.0–218.9 (average, 204.7) mm.; tail, 72.9–87.6 (79.7); bill (exposed culmen), 25.9–29.4 (26.9); height of bill at base, 5.6–6.9 (6.4); tarsus, 14.5–16.0 (15.2); middle toe without claw, 15.0–16.0 (15.5). *Adult female*: Wing, 191.0–211.1 (199.9); tail, 72.9–82.0 (77.7); bill, 25.4–26.9 (26.2); height of bill, 5.1–6.4 (5.8); tarsus, 14.0–16.5 (15.5); middle toe, 14.5–16.5 (15.5).

RANGE: Identical to species' range in Western Hemisphere.

TEXAS: *Migration*: Collected north to Cooke, east to Harris (July 9), south to Cameron and Hidalgo (Aug. 13), west to La Salle (Aug. 9) and Reeves cos.

[NODDY TERN, *Anous stolidus* (Linnaeus)]

Also known as Brown Noddy Tern, Brown Noddy, Common Noddy, and Noddy. A uniformly dark brown tern with whitish cap (becoming grayish posteriorly); has wedge-shaped tail. Young bird is paler brown with gray-brown cap bordered by whitish stripe above eye. Length, 15¾ in.; wingspan, 32; weight, 4¾ oz.

RANGE: Local on islands and islets in most tropical seas. Largely pelagic in winter.

TEXAS: *Hypothetical*: Four coastal records: Aransas Co., St. Joseph Island (remains of several dead birds, Nov. 27–29, 1890, H. P. Attwater); Nueces Co., Port Aransas (2 sighted, June 19–22, 1960, C. R. Bender, Connie Hagar, Kay McCracken; 1, June 26, 28, 1964, Mrs. Barnett, Hagar, A. W. O'Neil); Harris Co., La Porte (1, Sept. 10, 1961, Clinton Snyder, Linda Snyder).]

Skimmers: Rynchopidae

BLACK SKIMMER, *Rynchops nigra* Linnaeus

SPECIES ACCOUNT

A sleek, ternlike bird with forked tail. Jet black above and white below; has knifelike (laterally compressed), black-tipped red bill, the jutting lower mandible notably longer than the upper. Length, 18 in.; wingspan, 3¾ ft.; weight, 11½ oz.

RANGE: Locally on coasts and large estuaries of Western Hemisphere from Sonora and Massachusetts, south to Cape Horn. Winters chiefly from Pacific Mexico, n. Gulf coast, and Atlantic Florida locally to s. Chile and c. Argentina.

TEXAS: (See map.) *Resident* (fewer in winter): Breeds, mid-Mar. to early Sept. (eggs, Mar. 26 to Aug. 23) just above sea level. Locally very common to uncommon along Gulf coast. *Vagrant*: Wanders inland irregularly—often prompted by coastal warm-weather disturbances, and rarely farther than 100 mi. from Gulf—to Falcon Reservoir, Uvalde, San Antonio, Austin, Waco, and Dallas (casual). One inland winter sighting: Hidalgo Co., Mission (2 on Dec. 30, 1937, A. T. Hale, Jr.).

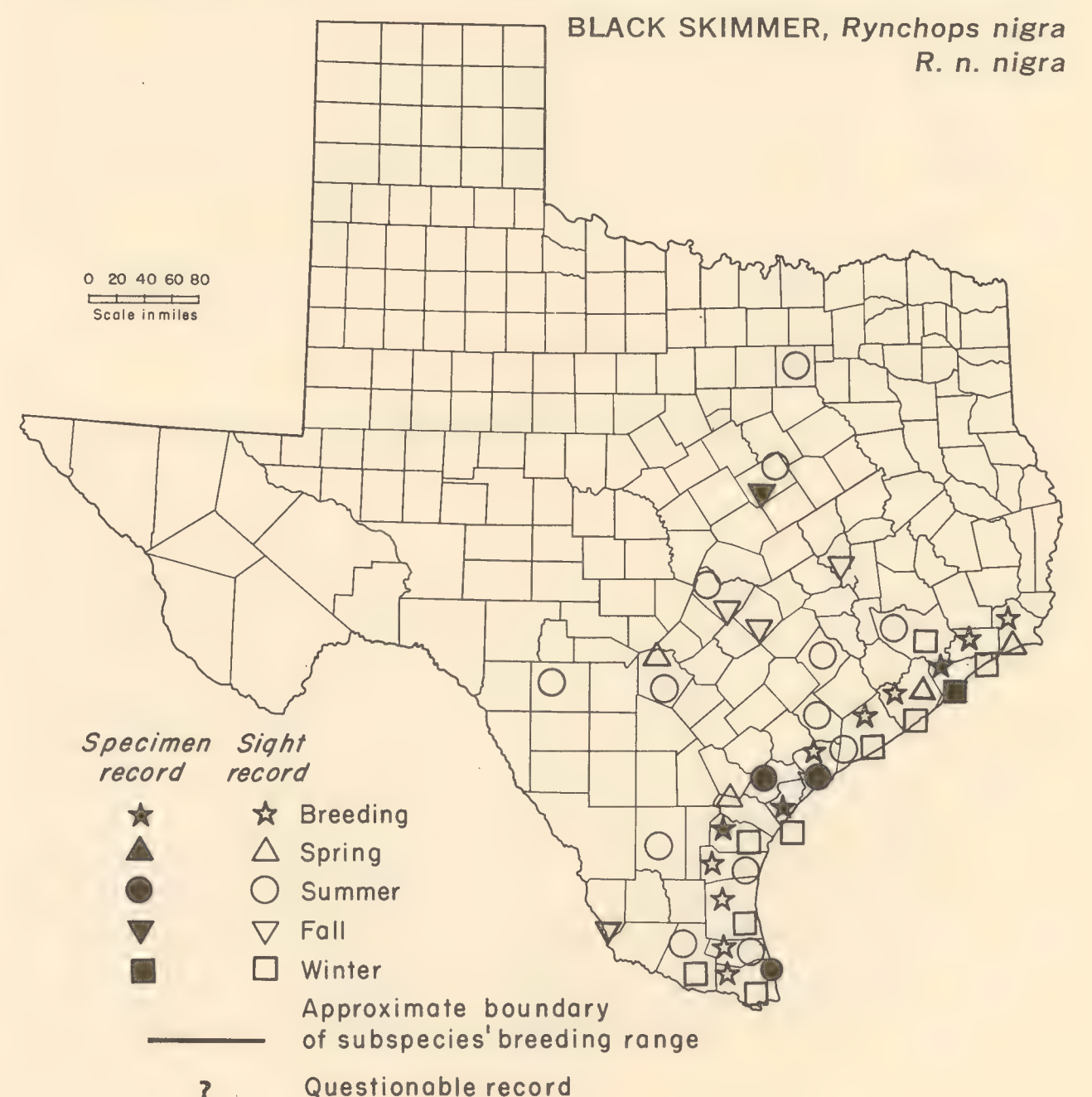
HAUNTS AND HABITS: Most unusual feeding method to be found among Texas birds is that of the Black Skimmer: This strange bird, like the two foreign species of Rynchopidae, gets breakfast, dinner, and midnight snack by flying low over the water and cutting the surface with its long lower mandible. In Texas, the Black Skimmer is a bird of sand and seashell beaches—estuaries, bays, lagunas, and the Gulf of Mexico; only in hurricane season, usually July through September, is there much chance of seeing even one individual along an inland waterway. Skimmers are colonial nesters and are gregarious at all times of the year, but are especially inclined to gather into sizable flocks in fall and winter. A large flock wheeling in synchronized flight is quite a spectacle, as the birds present, in turn, black backs, then white breasts flashing in the sunlight. Sitting on a beach or sandbar, all facing into the breeze, a group of skimmers suggests a platoon of soldiers.

When not foraging, this bird is buoyant, strong, and swift on the wing; however, its feeding flight is slower. As the skimmer slices the water with its lower mandible, it catches small fish, some shrimp, and other crustaceans; its short upper mandible clamps down on

anything that tries to get away. The theory has been advanced that the skimmer's bright red bill acts as a fish lure. Difficulties with this theory are that it is mostly the black terminal portion of the lower mandible that is inserted into the water, that the skimmer fishes often in very dim light, and that most fish seem to have poor color vision. These birds habitually re-skim the furrows they have just cut in the water; it is likely that some aquatic organisms are attracted to the disturbance and are then caught on the replot. Black Skimmers skim to a large extent at night, especially when the moon is shining, but do so by day as well; they do some daytime feeding while standing at water's edge. Skimmers are awkward on land and seldom walk far or fast on the beach.

Black Skimmers bark grating, but not loud, *kak, kak, kak, kak's*, etc., or more guttural *kuk, kuk, kuk's*; also heard are mellow *kaup's*. As with most birds, this species is more vocal during and just prior to the breeding season. Harshly *aaaring* parent birds often swoop near intruders in their nesting colonies, during which time their extremely well camouflaged chicks remain very still on the sand.

CHANGES: To a naturalist there are few more reas-



surging sounds than the soft barks of a pair or more of Black Skimmers as they go about their night's fishing; these notes go with Gulf breeze, foamy salt water lapping at the shore, and a moon-silvered bay. As long as skimmers thus bark it is a sign that the world is not yet completely poisoned.

In May and June, 1969, the Cooperative Fish-eating Bird Survey found 3,277 Black Skimmers on the upper coast, 3,065 on the central coast, and 840 on the lower coast.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BLACK SKIMMER, *Rynchops nigra nigra* Linnaeus

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Forehead white; pileum, sides of head to below eyes, sides of neck, and entire upper surface of body brownish black; tail chiefly white, tinged with drab on terminal portion of feathers, middle pair hair brown or dark drab on inner webs; outer webs of primaries fuscous black, inner webs mostly drab except at tips; secondaries similar; broad tips of secondaries and inner primaries white; axillars white, inner under wing-coverts grayish white, outer under wing-coverts fuscous; sides of head below eyes, lores, and entire lower surface white. Terminal half or two-thirds of bill black; base of maxilla poppy red, coral red, or vermilion; base of mandible scarlet, but edges of mandible dull yellow; iris vandyke brown; legs and feet coral red or orange vermilion; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults, but black of upper surface much duller, fuscous black or fuscous; broad collar on hindneck white. *First nuptial:* Acquired by complete prenuptial molt. Identical with nuptial adults. *First winter:* Acquired by wear from juvenal, with which it is practically identical.

Juvenal: Acquired by complete postnatal molt. Upper parts mostly light buff, pileum and hindneck with small shaft streaks or spots of fuscous; remainder of upper surface with all but broad tips of feathers fuscous, producing heavily mottled appearance; rump hair brown, narrowly edged with dull pale buff; tail mostly dull white, but hair brown or drab terminally, and on middle feathers with tip of buffy white; wings as in nuptial adults, but tertials broadly margined with light buff, median and lesser wing-coverts broadly tipped with buff like back, greater series hair brown, broadly tipped with white; lower surface white; sides of head washed with pale buff. Bill brownish black, tip light brown, base flesh color or pale red; legs and feet dull light brownish red. *Natal:* Upper parts pale grayish buff, somewhat mottled or spotted with hair brown or dull black; lower surface cream white.

MEASUREMENTS: *Adult male:* Wing, 381.0–404.1 (average, 390.9) mm.; tail, 120.9–130.5 (127.0); bill (exposed culmen), 66.0–73.4 (70.6); height of bill at base, 25.4–31.0 (28.7); tarsus, 34.5–37.6 (36.1); middle toe without claw, 20.1–23.1 (22.1). *Adult female:* Wing, 333.0–365.0 (344.9); tail, 104.6–119.9 (112.0); bill, 53.6–65.0 (57.9); height of bill, 22.1–25.4 (23.6); tarsus, 27.4–32.0 (29.9); middle toe, 17.0–20.6 (18.5).

RANGE: Locally on coasts from Massachusetts and Florida to Texas and Yucatán. Winters coastally from North Carolina (casually) and Florida to Texas, Yucatán, Isla Cozumel, Isla Margarita, and Trinidad; also s. Guerrero.

TEXAS: *Resident* (fewer in winter): Collected along coast northeast to Galveston, southwest to Cameron cos. *Vagrant:* One inland specimen: McLennan Co., Brazos River near Waco (1923, T. Gorch).

NESTING: *Nest:* Regularly in colonies; on sandy beach, flats, or shell-covered ridge, on sea island or mainland; slight depression in sand, shells, or pebbles of beach; without nest material. *Eggs:* 3–7, usually 4–5; rounded ovate to elongate ovate; white to pale greenish blue or pinkish buff; blotched and spotted with black and shades of dark brown, with shell markings of grays and lavender; average size, 45.0 × 33.5 mm.

Pigeons and Doves: Columbidae

BAND-TAILED PIGEON, *Chloroenas fasciata* (Say)

SPECIES ACCOUNT

Columba fasciata of A.O.U. check-list, 1957 (see Appendix A). A plump, small-headed, short-necked, chesty bird. Has slender black-tipped yellow bill (enlarged tip; soft, swollen at base); red-rimmed yellow eyes; short yellow legs. Purplish gray head and under parts (becoming whitish on crissum); bronzy green gloss on hindneck bordered above by white crescent on nape; grayish brown back, upper wings; bluish gray rump, base of tail, and secondaries; slightly rounded tail crossed midway by blackish band and terminally by very wide, pale gray band. Length, $14\frac{3}{4}$ in.; wingspan, 25; weight, 13 oz.

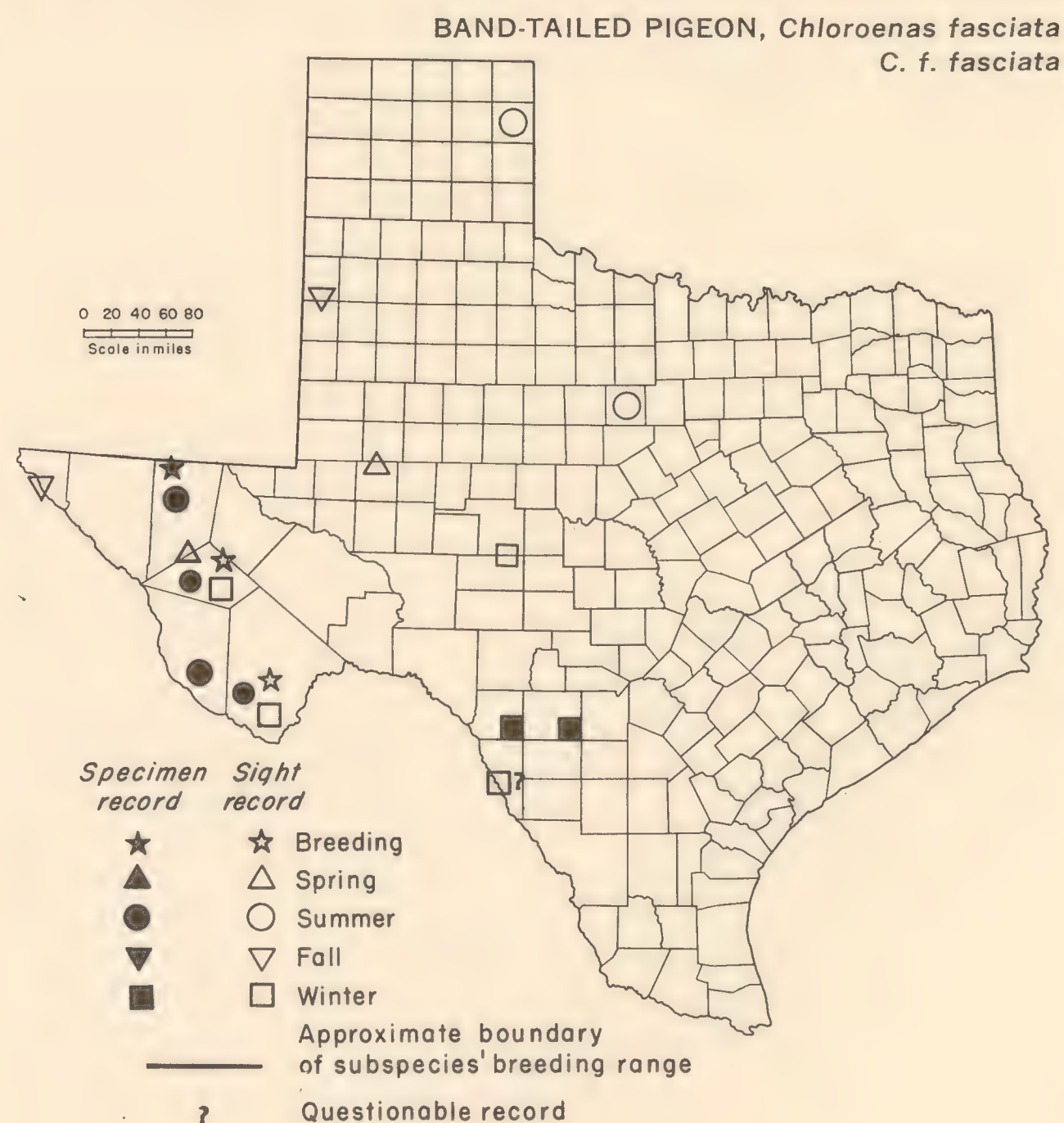
RANGE: S.w. British Columbia, south through Pacific states to mountains of s. Baja California, and from s. Utah and Colorado, south through highlands of s.w. United States, Mexico, and Central America to w. Panama. Northern populations winter mainly in California and Mexico.

TEXAS: (See map.) *Breeding:* Mid- or late Apr. to late Sept. (eggs, Apr. 30 to Aug. 21) from about 5,000 to 8,700 ft. Fairly common in Guadalupe, Davis, Chinati (nesting likely), and Chisos mts. *Migration:* Mid-Apr. to mid-May; early Sept. to late Oct. (extremes: Apr. 8, early June; July 13, Nov. 13). Fairly common locally in Trans-Pecos mountains; rare in remainder of Trans-Pecos and in western Panhandle; casual in northeastern Panhandle (2 seen, Canadian, July 13, 1954, A. S. Jackson) and at Midland (1 seen, May 12-17, 1964, Jerry Duke, et al.). *Winter:* Nov. to Mar. Irregular; usually scarce to rare in and near breeding range; casual in Brackettville-Uvalde-Eagle Pass area.

HAUNTS AND HABITS: A majority of the world's 289 Columbidae live at low altitudes, but the large Band-tailed Pigeon is in most portions of its range a highlander. In Texas, this handsome bird seeks juniper-oak-pine woodlands of Trans-Pecos mountains; in the Guadalupe, it perches in Douglasfir trees where Hermit Thrushes sing at eventide. During the breeding season, the pigeon lives preferably in timber and thickets of gulches and canyons and at the bases of rocky cliffs. In fall and winter, this decidedly gregarious species ventures in scattered flocks to lower altitudes to search for food in foothills and open deserts. Band-

tail flocks disband in spring and individuals go about singly or in pairs, but even at this season small groups often fly together to watering and feeding places. Whether a bird is drinking water from a mountain spring or sipping nectar from a foothill agave blossom, it shows off the peculiar (for birds in general) pigeon-dove drinking technique: immersion of the bill and sustained sucking without lifting the head to let sips trickle down the gullet.

When Bandtails are disturbed from their perches, typically on high bare branches, they fly rapidly away with loud clapping wings. This slapping noise ceases in prolonged level flight, which is usually above tree-top level. When descending a mountain slope, a Bandtail glides swiftly, using its wings only intermittently; its body rocks slightly from side to side in a headlong dive as the bird whizzes through the air. Where the species wanders and concentrates is determined by supplies of acorns, pinyon and other nuts, and small fruit—juniper, madrone (*Arbutus*), barberry (*Mahonia*), mistletoe, others; waste grain as well as a few grasshoppers and other insects are consumed also.



When feeding in trees and shrubbery, big Bandtails frequently flutter their wings a great deal as they pluck berries, etc., attempting to remain more or less upright on their twig perches. Often between feeding, the birds move to the interior branches of a pine to rest.

With spring, the male Band-tailed Pigeon moves to a sunny, exposed perch atop a dead tree where he hoots at irregular intervals hollow owlsh *oo-whoo's* or *whoo-oo-whoo's*. This is heard in spring and summer, typically in early morning and again in late afternoon.

DETAILED ACCOUNT: ONE SUBSPECIES

ROCKY MOUNTAIN BAND-TAILED PIGEON, *Chloroenas fasciata fasciata* (Say)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Pileum purplish drab or light purplish drab; nape with narrow half-collar of white; rest of hindneck metallic bronzy green or purple, these feathers very narrowly edged with dull gray; back, scapulars, and anterior lesser wing-coverts dull hair brown with more or less greenish or purplish tinge; rump and upper tail-coverts neutral gray or light neutral gray; tail basally neutral gray, middle portion with band of deep neutral gray or dull black, terminal half of tail drab gray, middle feathers rather darker; wing-quills fuscous, outer margins of secondaries, particularly inner ones, grayish; wing-coverts, except anterior lesser coverts, neutral gray to light neutral gray; lower parts purple drab, chin somewhat paler and more grayish; middle of abdomen and crissum white; lining of wing neutral gray or light neutral gray. Bill yellow, deep chrome, salmon orange, or yellow, but terminal third black; eye-ring brick red or jasper red; rest of bare ocular area pale smoke gray, slate gray, or brick red; iris straw color or cream buff, but outer ring alizarine pink or lilac; legs and feet cadmium yellow, light orange-yellow, or deep chrome; claws black. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male but coloration much duller; upper parts more brownish; lower surface with less vinaceous or purplish tinge, more washed with brown. Yellow of bill and feet obscured. *Adult male and female, winter:* Acquired by complete postnuptial molt. Like corresponding sex of nuptial adults. *Male and female, first winter:* Acquired by complete postjuvenile molt. Like adult in winter. *Juvenal:* Acquired by complete postnatal molt. Similar to adult female, but still duller and more brownish, and without metallic feathers on hindneck, lacking also white half-collar on nape; lesser wing-coverts margined with dull pale buff, primaries tipped with cinnamon, particularly on outer webs; feathers of breast and jugulum similarly marked with cinnamon or dull brown. Bill pinkish clay color, but with black subterminal band and dull white tip; eye-ring pinkish vinaceous, rest of bare area olive gray or dark gray; iris dresden brown; legs and feet pinkish buff; claws wood brown at base, avellaneous at tip. *Natal:* Long down entirely deep buffy yellow or honey yellow to deep colonial buff.

MEASUREMENTS: *Adult male:* Wing, 195.1–221.0 (average, 208.8) mm.; tail, 121.9–151.1 (139.2); bill (exposed culmen), 16.0–20.1 (18.0); tarsus, 24.4–29.4 (26.9); middle toe without claw, 26.4–34.0 (30.2). *Adult female:* Wing, 193.0–217.9 (204.0); tail, 120.9–149.1 (134.4); bill, 15.5–19.6 (17.8); tarsus, 23.9–28.4 (25.9); middle toe, 26.4–33.0 (29.7).

RANGE: Mountains of Utah and Colorado, south through highland Mexico to Oaxaca. Winters irregularly from s.e. Arizona, s. New Mexico, and s.w. Texas southward through breeding range.

TEXAS: *Breeding:* Collected in Culberson, Jeff Davis, Presidio, and Brewster cos. *Winter:* Two specimens: Kinney Co., Fort Clark (Dec. 18, 1897, E. A. Mearns); Uvalde Co., Uvalde (Dec. 3, 1915, B. Godhold).

NESTING: *Nest:* On wooded mountain slopes; in bush, tree,

or stump, or even on ground; loosely constructed platform of twigs, leaves, and moss; lined with pine needles. *Eggs:* 1–2, usually 1; elliptical ovate; white, unmarked; average size, 39.6 × 27.7 mm.

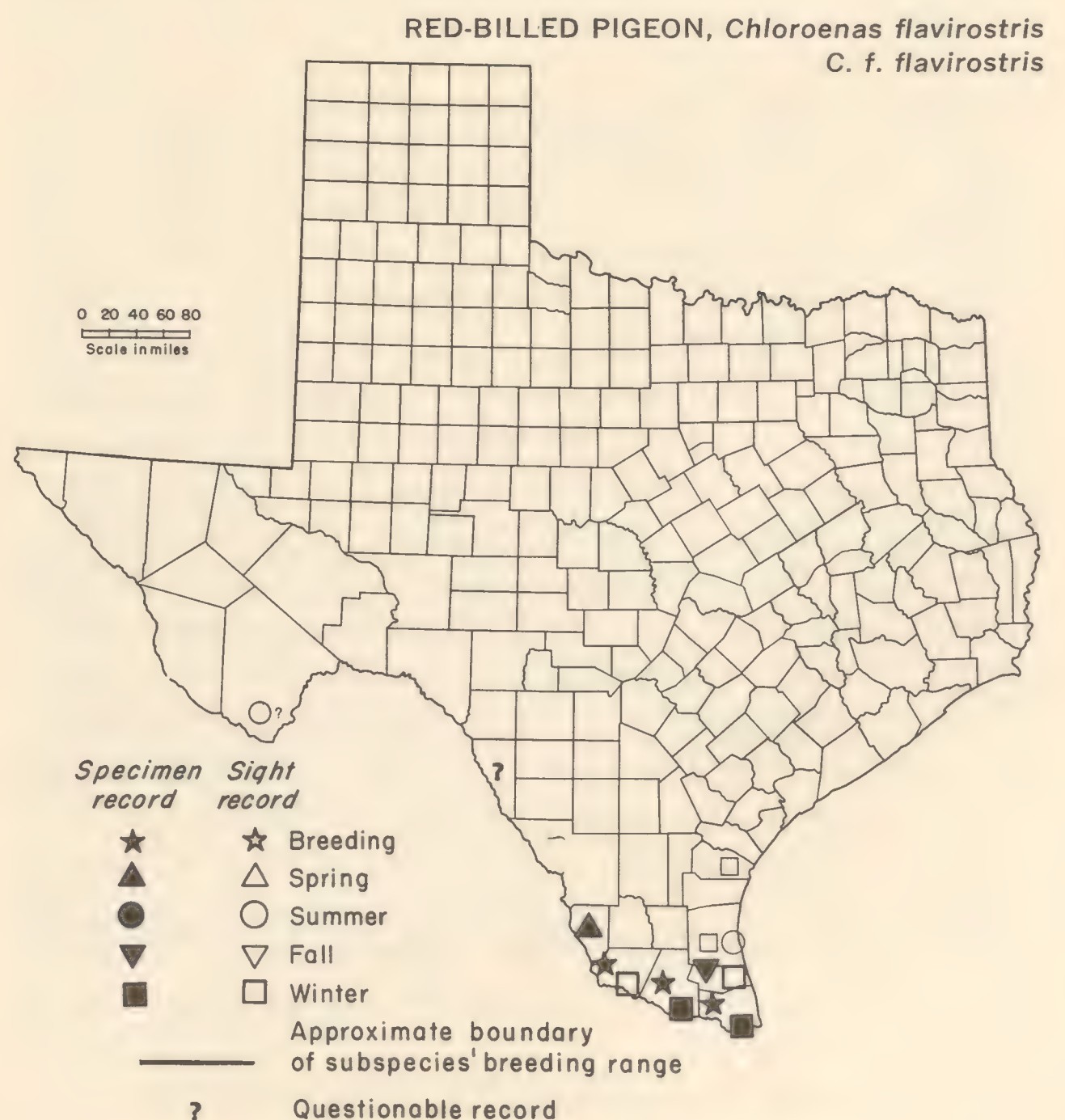
RED-BILLED PIGEON, *Chloroenas flavirostris* (Wagler)

SPECIES ACCOUNT

Columba flavirostris of A.O.U. check-list, 1957 (see Appendix A). A rather large, uniformly dark pigeon with small, whitish-tipped red bill; broad, almost square-tipped (when folded) tail; swift, direct flight. Brownish purple forequarters; rich brown lesser wing-coverts; grayish brown back and scapulars; slaty hind-quarters, primaries, and secondaries. Length, 14½ in.; wingspan, 24¾; weight, 9 oz.

RANGE: S. Sonora and extreme s. Texas, south chiefly through lowlands of Mexico (including Tres Mariás Islands) and Central America to Costa Rica. Largely resident, but northernmost population partially withdraws to Mexico.

TEXAS: (See map.) *Resident:* Breeds, mid-Feb. to mid-Aug. (eggs, Feb. 21 to Aug. 8) from near sea level to about 275 ft. Uncommon and very local (formerly fairly common) in Rio Grande delta, becoming scarce upriver to Falcon Reservoir, and upcoast to Norias in Kenedy Co. (nesting north of delta unconfirmed); rare during coldest months. One record from central coast: Nueces Co., Flour Bluff (Jan. 26–Feb. 15, 1969, T. S. Schulenberg, D. H. Hardy). Two June sightings at Big Bend Nat. Park lack substantiation; rather frequent plausible reports, some as late as 1950's, at Eagle Pass and Laredo.



HAUNTS AND HABITS: The handsome Red-billed Pigeon has a magnificent jungle voice, now almost stilled in Texas, the bird's only U.S. home. Though beginning to decline, it is still widespread in Mexican and Central American lowlands and foothills; in this part of the world the Redbill is the standard large, hot-country pigeon, just as the big Bandtail represents the family in high, cool pine-oak sierra forests.

In the Rio Grande delta, the Red-billed Pigeon seeks the tallest timber and brush it can find—tall trees of Montezuma baldcypress (*Taxodium mucronatum*), tepeguaje (*Leucaena pulverulenta*), Texas ebony (*Pithecellobium flexicaule*), mesquite (*Prosopis glandulosa*), Mexican ash (*Fraxinus berlandieriana*), hackberries (*Celtis*), elms (*Ulmus*), and black willow (*Salix nigra*). In the breeding season this pigeon is seen singly or in pairs, sometimes in small groups at watering or feeding places. Where the species is abundant, flocks containing up to several hundred individuals fly about during cooler months.

The Redbill is a high, swift flier. When viewed against the sky, a group of these pigeons resembles a silhouetted parrot flock, as the height, flight speed, and wing flapping are somewhat similar. When the present species alights, however, it is not so parrotlike: Redbills commonly land on high bare limbs; Red-crowned and other mostly green Mexican parrots usually perch in crowns of leafy green trees. The Redbill drinks while standing on sand and gravel bars of tropical rivers, but otherwise it is not seen a great deal on the ground. Favorite foods along the Texas-Tamaulipas border are fruits of hackberry, *Condalia*, *Zizyphus*, and wild grape; like many other *tierra caliente* birds of diverse families, it relishes tropical figs (*Ficus*) and palm seeds in Latin America. Formerly flocks fed much in cornfields along both sides of the Rio Grande. The present game bird tends to be shy, a most useful survival trait.

The Red-billed Pigeon generally calls from a lofty, often bare tree branch. Males first emit a mighty, upwelling *woooooOOOOO*; this is followed quickly by usually three *up-cup-a-coo*'s. Territory is thus proclaimed from February into August.

CHANGES: The Red-billed Pigeon requires tall dense brush and at least some patches of sizable trees in its landscape. The year 1920 marked the beginning of serious habitat destruction in the Rio Grande delta, this bird's sole U.S. nesting ground. By 1945 approximately 90 percent of the species' breeding trees and shrubs had been removed. Then came two blows which virtually extirpated the species as a U.S. bird: First, the great freeze of 1951 changed the dominant agricultural crop from little-sprayed citrus to cotton which is repeatedly drenched with pesticides and herbicides; and second, the completion in 1953 of Falcon Dam, on the Rio Grande in upper Starr County held back so much water that the water table in the delta dropped drastically, killing nearly all the large native trees.

Since Falcon Dam, almost the only natural area that

still supports big tepeguajes and Texas ebonies is the small (slightly under 2,000 acres) Santa Ana National Wildlife Refuge (Hidalgo Co.), where water is pumped from wells to supply trees and aquatic birds. The Redbill's struggles in its last U.S. toehold are chronicled in *Audubon Field Notes*. Some milestones: 150 pairs nested in Santa Ana in 1953 (L. C. Goldman); 70 birds counted there on August 12, 1960 (R. J. Fleetwood); of three nests built on the refuge during the 1963 breeding season, two were destroyed (Fleetwood); in 1969, Santa Ana contained 2 or 3 pairs of Redbills (R. J. Hitch); 18 birds present, summer 1971, highest number in some years (Fleetwood); and in Bentsen-Rio Grande Valley State Park, where all large trees have been dead since the mid-1950's, one nest was discovered in 1968 (Allegra Collister, Nancy Hurley, Lois Webster). From the Rio Grande into Mexico for one hundred miles, the land since the late 1950's has been almost as dismally cleared and hydrocarboned as it has on the Texas side of the delta.

The senior editor likes to recall the good days of the early 1950's when he rode down to Xilitla, San Luis Potosí, to take part in L. Irby Davis' prodigious Mexican Christmas bird counts. The trip south always started at Brownsville, Texas. Beyond San Fernando, Tamaulipas, the altimeter needle in the jeep started perking up. Upon approaching Padilla, the first great flocks of Red-billed Pigeons would start sweeping overhead, seemingly flying high over the Sierra Madre Oriental lying far and blue on the southwestern horizon. When Redbills appeared in force, flocks of parrots lay just ahead. It was "curtain going up" on the Tropics where life is at its most colorful and varied best! Nowadays, Mexicans, like the Americans before them, are busy eliminating their Redbills via the same clearing, poisoning, and damming route.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN RED-BILLED PIGEON, *Chloroenas flavirostris* *flavirostris* (Wagler)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Head and neck purple drab, center of crown and occiput sometimes grayish; back, scapulars, inner secondaries, and inner greater wing-coverts deep rather olivaceous hair brown; rump and upper tail-coverts between slate gray and plumbeous; tail slate color to dark neutral gray, inner edges of feathers somewhat brownish; primaries fuscous or brownish neutral gray, very narrowly edged on outer webs with dull white; secondaries neutral gray; outer wing-coverts more plumbeous; middle lesser wing-coverts vinaceous brown; sides of head and of neck, chin, throat, and breast similar to pileum, except breast more brownish; remainder of lower surface, including lining of wing, bluish gray like rump. Basal half of bill, including cere, light pink and coral red, terminal portion flesh color or dull white; eye-ring lake red, dark coral red, or carmine; iris orange-yellow to reddish orange or orange-red; legs and feet carmine, dark coral red, or purplish red; claws light brown or flesh color. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male but slightly duller; top of head usually more grayish; reddish brown patch on lesser wing-coverts duller and of less extent. *Adult male and female, winter:* Acquired by complete postnuptial molt. Like corresponding nuptial adult. *Male and female, first winter:* Acquired

by complete postjuvenile molt. Like adult in winter. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adult female but very much duller; anterior upper parts decidedly more brownish; hindneck with little trace of purplish drab; lower surface anteriorly paler, much duller, and more brownish; reddish brown on upper wing-coverts duller and restricted mostly to tips of feathers. *Natal*: Skin of upper surface dark reddish brown with thin covering of blackish hairlike feathers; lower parts light colored and mostly unfeathered.

MEASUREMENTS: *Adult male*: Wing, 182.1–198.7 (average, 192.0) mm.; tail, 111.5–127.0 (119.6); bill (exposed culmen), 13.5–16.0 (14.5); tarsus, 23.1–27.9 (25.7); middle toe without claw, 27.9–31.5 (29.7). *Adult female*: Wing, 184.4–207.0 (193.5); tail, 112.0–131.5 (119.6); bill, 14.0–15.5 (14.7); tarsus, 23.9–26.9 (25.1); middle toe, 28.4–31.5 (29.9).

RANGE: C. Sonora and extreme s. Texas, south through Mexico to Honduras and n. Nicaragua.

TEXAS: *Resident* (fewer in winter): Collected in Zapata, Starr, Hidalgo, Willacy, and Cameron cos.

NESTING: *Nest*: In woodlands and high brush; placed in bush or tree; frail platform of sticks, grass, and roots; lined with fine weed stems, grass, and rootlets. *Eggs*: Usually 1, possibly 2; oval to elliptical oval; pure white, unmarked; average size, 38.9 × 27.2 mm.

ROCK DOVE, *Lithoenas domestica* (Gmelin)

SPECIES ACCOUNT

Columba livia of A.O.U. check-list, 1957 (see Appendix A). Also known as Domestic Pigeon. A familiar, medium-sized pigeon with white rump. Extremely variable in color pattern, but typical birds are mainly gray (except for rump) with purplish sheen on head, neck, and breast; and broad, blackish terminal tail-band. Length, 12¼ in.

RANGE: *Lithoenas domestica*, native to the Old World, is recognized as the parent stock of the feral or semiferal Domestic Pigeon, now found the world over, especially about farms and in and near cities.

TEXAS: *Resident*: Breeds, year-round, but less enthusiastically during coldest months. Common locally.

HAUNTS AND HABITS: Man has introduced the Rock Dove (Domestic Pigeon) in all parts of the world except the oceans and poles. In Texas, the Rock Dove's claim to being a wild bird—which is what the present book is about—is shaky. Here there are no rocky sea cliffs to support free-living populations of the species. Pigeons which nest on ledges of buildings in cities frequently are dependent on handouts from people, and rural birds usually more or less belong to somebody. In the country, individuals, pairs, and flocks glean grain put out as cattle and chicken feed; they also peck at salt intended for livestock and ingest grit which helps digestion.

Flight of the Rock Dove is swift, strong, and usually direct and is performed with relatively few, but powerful, wing-beats. When individuals are flushing, their wings sometimes make clapping sounds. A habit of the Rock Dove in need of emphasis is that the bird ordinarily perches on buildings, boulders, rocks, and the ground, but very seldom in trees. At least one university zoology professor did not know this; much to his

embarrassment he shot from its rooftop perch a racing pigeon (with several bands on its leg) under the impression that he was taking a specimen of the arboreal Band-tailed Pigeon!

The Rock Dove's gurgling *oo-roo-coo* or *coo-roo-coo* is heard all year except when weather is fantastically cold or hot.

DETAILED ACCOUNT: NO SUBSPECIES RECOGNIZED IN NEW WORLD

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Pileum, sides of head, chin, and upper throat light slate gray; hindneck metallic killarney green, the sides of neck with tinge of eupatorium purple; back and lesser and middle wing-coverts pale to light neutral gray, upper portion of back shading to deep neutral gray; rump white; upper tail-coverts between deep neutral gray and slate gray, feathers of these parts, except white rump, with more or less evident dark scalelike tips; tail deep neutral gray with broad fuscous black or chaetura black band at end of tail, outer pair of tail feathers with outer web white except at tip; tips of primaries hair brown, becoming neutral gray at base of outer webs, and pallid neutral gray on inner webs; primary coverts, also ends of greater wing-coverts and of inner secondaries, pale neutral gray, a broad bar across middle portion of greater coverts, another across terminal portion of secondaries, fuscous black; lower throat and jugulum metallic killarney green, anteriorly with eupatorium purple sheen; upper breast metallic rather dull eupatorium purple; remainder of breast and crissum neutral gray; abdomen light neutral gray; sides and flanks similar but somewhat paler; lining of wing white, edges mostly neutral gray. Bill vinaceous slate color or plumbeous, inclining to dull white on cere; iris yellow, orange, or reddish orange, with inner ring of yellow; legs and feet dull red. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial*: Acquired by wear from first winter. *First winter*: Acquired by complete postjuvenile molt. Similar to adults in winter. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but chin bare of feathers; head, throat, and neck dark brownish slate color; back and scapulars more brownish; rump and upper tail-coverts darker and more brownish, the feathers margined with blackish brown; white outer webs of outermost tail feathers not so purely white; wing-quills more brownish, primaries with narrower whitish tips; wing-coverts more brownish and narrowly margined with grayish white, two black bands of wing more irregular. *Natal*: Light straw yellow.

MEASUREMENTS: *Adult male*: Wing, 215.1–225.1 (average, 220.7) mm.; tail, 109.0–117.1 (113.3); bill (exposed culmen), 18.0–20.6 (19.3); height of bill at base, 6.1–8.6 (7.4); tarsus, 27.9–33.0 (30.7); middle toe without claw, 25.4–30.5 (27.2). *Adult female*: Wing, 213.1–223.0 (216.9); tail, 101.1–108.0 (102.4); bill, 17.0–19.6 (18.3); height of bill, 6.4–7.1 (6.9); tarsus, 28.4–32.0 (29.7); middle toe, 25.4–28.4 (26.9).

TEXAS: *Resident*: See species account.

NESTING: *Nest*: Placed under rocks and in caves of cliffs, on timbers under bridges and in nooks about buildings, often along rivers, in holes, on ledges, or in birdhouses; slight structure, materials merely laid on surface; composed of grass, plant stems, weeds, seaweed, and other material, with a little lining of similar, sometimes finer, materials. *Eggs*: 2, oval or elliptical oval; somewhat glossy, pure white, unmarked; average size, 39.4 × 29.2 mm.

MOURNING DOVE, *Zenaidura macroura* (Linnaeus)

SPECIES ACCOUNT

A trim, brown dove with small head; slim neck;

long, pointed, wedge-shaped tail edged with white. Essentially grayish buff above with bluish gray pileum, purplish gloss on neck, black spot on side of head (below ear-coverts), and black spots on wing; pinkish-tinged buffy below. Length, $11\frac{3}{4}$ in.; wingspan, $17\frac{1}{2}$; weight, $4\frac{1}{2}$ oz.

RANGE: S.e. Alaska and s. Canada, south through United States to c. and Pacific Mexico (including Tres Mariás and Clarión islands), and in Panama (breeding confirmed here, but not elsewhere in Central America); also West Indies. U.S. races winter mainly from n. United States through Mexico (widely) to w. Panama.

TEXAS: (See map.) *Resident:* Breeds, virtually year-round, chiefly from Mar. to Sept. (eggs, second week in Jan. and Jan. 26 to Dec. 20) from near sea level to 6,000 ft.—very occasionally to 8,000 ft. Very common (abundant prior to 1960) to fairly common throughout, but withdraws somewhat from northern quarter during coldest months.

HAUNTS AND HABITS: The Mourning Dove is the only native Texas bird with written occurrence records in every one of the state's 254 counties; the only other wild bird which is equally ubiquitous is the imported English House Sparrow. As the favorite upland game bird of Texas hunters, the Mourning Dove is shot by the millions every year; additional thousands are killed annually by automobiles, utility wires, poisoned grain, bad weather, disease, and many other foes and hazards. Yet astonishingly, the Mourning Dove is still (as of 1972) numerous in most parts of the Lone Star State.

Major reason for this flourishing condition is that *Zenaidura macroura* is able to thrive in almost all land habitats: seashores, prairies, plains, deserts (but not entirely waterless ones since the bird must drink once a day), savannahs, brushlands, wooded country (any

species of grass, herb, bush, or tree, or their lack will do), mountains, mesas, canyons, gulches, gullies, watercourses. Furthermore, almost any annual rainfall or altitude suits this amazingly versatile creature. In addition to wildlands, it lives about ranches, farms, towns, and cities. Very high mountains and heavy unbroken forest are not favored by the bird, but nowadays almost none of the state exhibits either of these conditions. In summary, the Mourning Dove is ready, willing, and able to obtain food, shelter, nest sites, and nesting material in almost any habitat found on the land surface of Texas. The second factor that helps the Mourning Dove is its long breeding season. Except in the coldest portion of the state, the dove nests all year; this is in startling contrast to most wild birds, which attempt to raise only one or two broods a year. During the main breeding season, pairs scatter over the country, but in autumn individuals assemble loosely in rather large numbers around water holes, especially at dusk, or where food is abundant.

Flight is swift—extremely so when the bird is dodging shotgun blasts; normal cruising speed is 40 m.p.h. The Mourning Dove rises with considerable whistling of its wings; occasionally, the bird suddenly checks its flight before alighting, wing feathers then producing a loud sound much like that of stout cloth tearing. This dove feeds usually on the ground, principally on weed seeds, also waste grain—wheat and sorghum being favored where available—and a few insects. In pine woods the Mourning Dove at times walks out on limbs to pick seeds from pine cones. Especially in late summer, individuals take salt at livestock salt licks and troughs. Roosts, often communal in fall and winter, are in trees or other elevated places, but birds sometimes remain at rest on the ground.

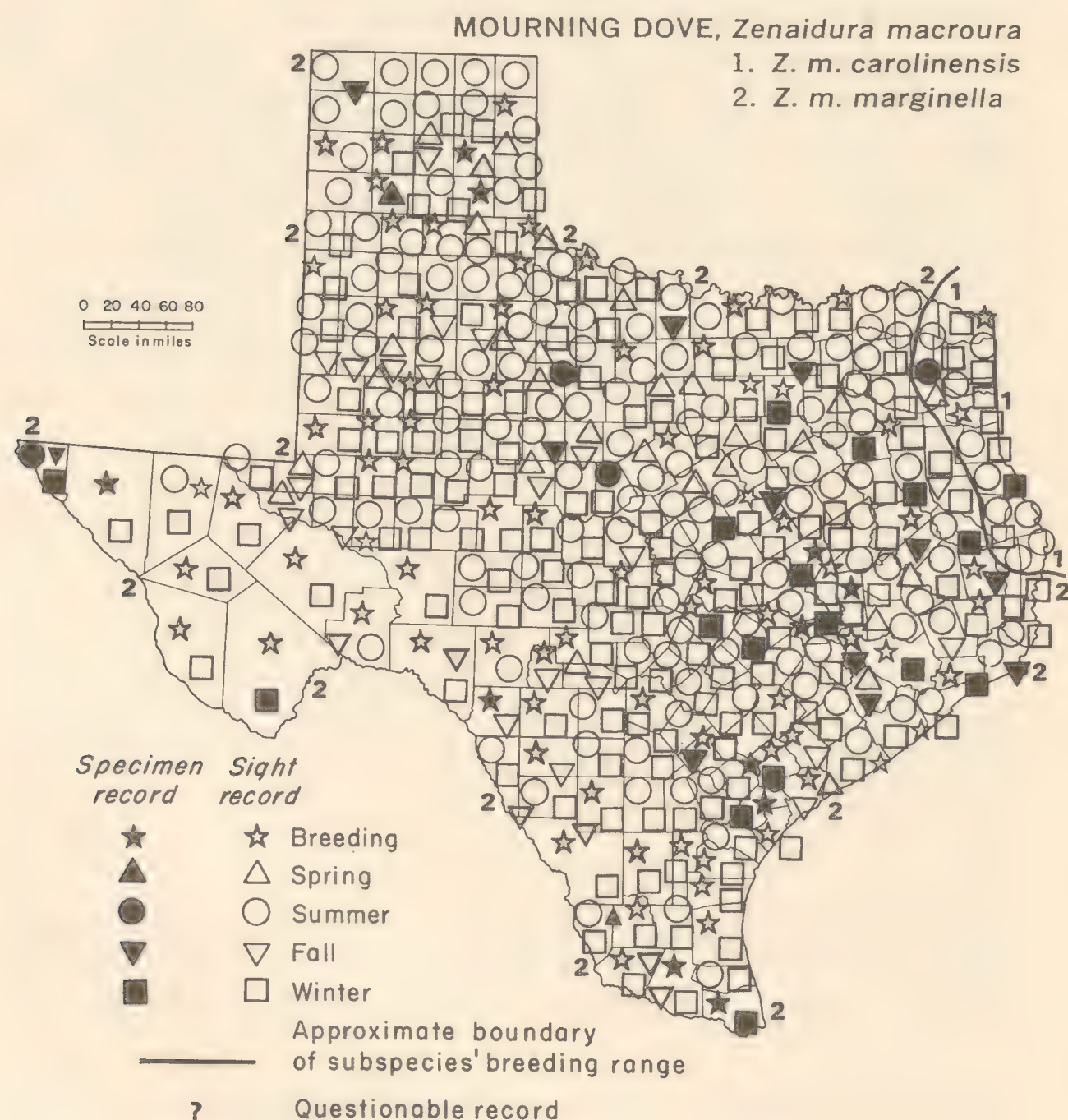
The Mourning Dove, so named for its moaning territory-courtship call, commonly utters a hollow *ooah*, *cooo*, *cooo*, *coo* (only the three *coo*'s audible at a distance) from a more or less elevated perch. The female *coos* less often than the male and her voice is thinner and weaker. Males are heard all year except when they are molting or when the weather is very cold or windy. Wings of both sexes whistle in all seasons.

CHANGES: Even the extremely adaptable Mourning Dove started going downhill about 1960. The rate of decline accelerated to approximately 4 percent annually from 1966 through 1971. Nevertheless Texas hunters were able to harvest $9\frac{1}{2}$ million of these doves in 1970 and 7 million in 1971. Drought and severe local outbreaks of trichomoniasis, a protozoan disease of the upper digestive tract, are thought to have contributed to Mourning Dove diminution, according to Texas Parks and Wildlife Department biologist K. E. Gamble.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN MOURNING DOVE, *Zenaidura macroura carolinensis* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead and superciliary stripe deep fawn color; central portion of occiput and nape slate gray or



neutral gray, nape more brownish; lower hindneck dull neutral gray mixed with brownish and, particularly laterally, glossed with light metallic rosaceous purple; back, scapulars, tertials, rump, upper tail-coverts, and inner secondaries deep drab to dark buffy brown; middle tail feathers like back but darker and duller; next feathers dull neutral gray or light neutral gray becoming white on outer feathers, all crossed by irregular black bar on middle portion; inner webs of scapulars and tertials with large black longitudinal markings; a few spots of black on outer webs; primaries deep neutral gray or fuscous and usually more brownish on tips; secondaries similar; anterior lesser wing-coverts deep drab to dark buffy brown; remainder of wing-coverts neutral gray, washed with dull brown of upper surface; lower parts vinaceous fawn, whitish on chin and darker and more vinaceous on jugulum and breast; abdomen and lower tail-coverts light pinkish cinnamon; sides and flanks light neutral gray washed with pale cinnamon; lining of wing neutral gray to light neutral gray. Bill black; cere bluish gray; corner of mouth lake red or brick red; naked skin around eye pale blue or slate gray; iris vandyke brown or yellow; legs and feet burnt carmine or rose purple; claws black, bluish, or brownish black. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male, but occiput and hindneck washed with olive brown; jugulum and upper breast more fawn color. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but tail shorter, plumage duller; head and neck more brownish, lacking slate gray of male; metallic color on sides of neck duller and less extensive; chin more extensively dull white; sides of head and of neck and anterior lower parts much duller, more brownish (less vinaceous), sometimes without any vinaceous tinge; posterior lower parts more deeply buff. Bill black; eye-ring lavender gray; iris vandyke brown; legs and feet burnt carmine; claws dark drab. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like respective adult in winter. *Male and female, first nuptial*: Acquired by wear from first winter. Similar to nuptial adult, but plumage somewhat duller; middle pair of tail feathers with broader, more rounded tips. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to adult in winter but somewhat duller; primary coverts with narrow pale tips; middle pair of tail feathers with broader, more rounded tips. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adult female, but somewhat lighter, more grayish above, feathers edged with buffy white or very pale buff, particularly on back, scapulars, wing-coverts, rump, and upper tail-coverts; sides of head and neck duller and more grayish, less fawn color; lower parts much duller, more grayish, less fawn color or vinaceous, feathers of breast and jugulum more or less broadly tipped with dull wood brown or dull pale buff. *Natal*: Skin dull yellow, sparse downy covering white.

MEASUREMENTS: *Adult male*: Wing, 137.9–152.9 (average, 147.3) mm.; tail, 119.9–162.6 (142.2); bill (exposed culmen), 13.0–15.0 (13.7); tarsus, 19.6–22.1 (20.9); middle toe without claw, 19.0–22.6 (20.6). *Adult female*: Wing, 135.1–146.0 (139.7); tail, 114.0–136.9 (123.2); bill, 11.9–14.0 (13.0); tarsus, 19.0–21.1 (19.8); middle toe, 18.5–21.1 (19.8).

RANGE: Wisconsin to s. New Brunswick, south to extreme e. Texas and s. Florida; also Bahamas. Winters casually throughout northern portion of breeding range, but chiefly from e. Iowa and Massachusetts through e. Mexico to Panama; also Cuba.

TEXAS: *Breeding*: Two specimens, both from Camp Co.: Leesburg, 394 ft. (June 4, 1953, collector unknown); Pittsburg, 398 ft. (June 4, 1953, collector unknown). Fairly common. *Winter*: Taken north to Clay (Nov. 20), east to Shelby and Jefferson (Oct. 5), south to Zapata (Oct. 15), west to El Paso (Sept. 22) cos. Fairly common.

NESTING: *Nest*: In wooded or open areas, swamps, marshes, orchards, or about dwellings; in tree, bush, on stump, fence, or ground, occasionally in nest of other bird, even in that of Black-crowned Night Heron; poorly constructed platform of twigs, straw, weed stalks, leaves, moss, roots, and similar vegetation; lined with fine twigs, leaves, and rootlets. *Eggs*: 1–4, usually

2; oval to elliptical oval, elliptical ovate, or ovate; white, unmarked; average size, 28.2 × 21.6 mm.

WESTERN MOURNING DOVE, *Zenaidura macroura marginella* (Woodhouse)

DESCRIPTION: *Adult male and female, nuptial plumage*: Like *Z. m. carolinensis* but slightly larger; upper parts paler and more grayish (less brownish).

MEASUREMENTS: *Adult male*: Wing, 142.0–156.4 (average, 149.4) mm.; tail, 120.9–158.0 (138.2); bill (exposed culmen), 12.4–14.5 (13.7); tarsus, 19.0–21.6 (20.1); middle toe without claw, 18.5–22.1 (20.3). *Adult female*: Wing, 132.6–151.9 (142.2); tail, 117.1–133.6 (124.0); bill, 13.0–15.0 (13.7); tarsus, 18.0–20.6 (19.3); middle toe, 18.5–20.6 (19.3).

RANGE: S.e. Alaska and s.w. Yukon (probably) to n.e. Manitoba, south to s. Baja California, Oaxaca, and Veracruz. Winters casually throughout northern portion of breeding range, but chiefly from n. California and Iowa through Mexico to Guatemala and Costa Rica.

TEXAS: *Resident*: Collected north to Dallam, east to Cooke, Angelina, and Chambers, south to Cameron, west to Brewster and El Paso cos. Very common.

NESTING: *Nest*: In woodlands and open areas; in tree or bush, in cactus, on fence, ledge of cliff, or the ground, sometimes in nest of other bird, especially that of Yellow-billed Cuckoo, Mockingbird, or Cardinal, rarely Caracara or House Sparrow; occasionally up to 40 ft. above ground; materials of nest like those of *Z. m. carolinensis*. *Eggs*: 1–3, usually 2; elliptical oval to ovate or elliptical ovate; white, unmarked; average size, 27.9 × 20.9 mm.

PASSENGER PIGEON, *Ectopistes canadensis* (Linnaeus)

SPECIES ACCOUNT

Ectopistes migratorius of A.O.U. check-list, 1957 (see Appendix A). Also known as Wild Pigeon. A large pigeon with long, pointed, graduated tail; voice was loud and harsh. Resembled the smaller Mourning Dove, but was more bluish above, ruddier below; lacked black spot on side of head; had red eyes, eye-ring, legs. Female was decidedly duller. Length, 16¼ in.; wingspan, 24; weight, 9 oz. (fide J. R. Forster) or 12 oz. (E. H. Eaton).

RANGE: *Extinct*. Last specimen taken in wild at Sargents, Pike Co., Ohio (Mar. 24, 1900, fide A. W. Schorger); last bird died in captivity in the Cincinnati Zoo, Ohio (Sept. 1, 1914, fide S. A. Stephen). Formerly from s. Canada, south, east of Rockies, to s. United States. Wintered mainly in s. United States from Oklahoma and Texas to North Carolina and Florida; a few records for e. Mexico; two specimens taken in Cuba. European occurrences were probably based mostly or wholly on escaped cage birds.

TEXAS: Last report was of two individuals taken on upper Galveston Bay (Mar., 1900, fide H. C. Oberholser). *Breeding*: Two 19th-century records in northeastern Texas (see detailed account). *Winter*: Sept. to Mar. 1. Formerly irregularly abundant to scarce in much of eastern two-thirds south to about 29th parallel (see detailed account).

HAUNTS AND HABITS: The mighty clouds of Passenger Pigeons which swept eastern North America in yester-

centuries passed over mountains and plains, but often settled in great forests, particularly those composed largely of oaks; these acorn-abundant woods were also favored feeding, roosting, and nesting haunts. This famous species lived as well in wet or dry semiopen country and in bushy areas; it often invaded cultivated fields of all sorts, especially grain fields, also gardens, old stubble fields, and weedy areas of any kind. The most spectacular feature of the life history of the Passenger Pigeon was the almost unbelievably large flocks into which it gathered. These great congregations were a wonder to all who beheld them. Alexander Wilson, father of American ornithology, computed that one flight he saw in Kentucky contained 2,230,272,000 birds.

Passenger Pigeon flight was very strong, swift—estimated at 60 to 70 m.p.h.—usually direct, and sometimes undulating. Often, the bird flew at a considerable height, usually about two hundred feet, at times much higher, but on other occasions low over treetops or near the surface of the ground. The basic items in the Passenger's diet were acorns, earthworms, and salt; the latter was a highly successful bait used by pigeon hunters to lure flocks to their guns and nets. Supplemental foods were wild fruits, berries, weed seeds, buds, grain, a few insects; in captivity, it also ate grubs, beetles, and cooked liver and eggs.

The male's courtship display consisted of spreading the tail, drooping the wings, swelling the throat, and strutting before the female. Nest building began usually in early April and there was one brood a year. Male and female together built a flimsy nest about nine inches in diameter in three to six days. Both sexes assisted in incubation, which occupied about fourteen days; the male sat on the one egg by day, the female at night. Both collaborated in the care of the young. As with other pigeons and doves, the nestling was first given the crop secretion, pigeon milk; later, a mixture of this fluid and solid food. At a fairly crosswise angle, the squab inserted its bill into the mouth of either its mother or father; then the parent slowly regurgitated the curdy milk into its offspring's gullet. Adults, especially those which had lost their young, sometimes fed each other, thus relieving pressure in their crops. The nestling was fed to fatness for fourteen days; still unable to fly, it was then suddenly abandoned by its parents. After a week of living on its fat, the immature one was very skinny but it could flutter enough to seek its own food. The Passenger Pigeon bred in captivity as well as in the wild.

Ectopistes canadensis was quite noisy. Individuals in a large flock had to be loud to be heard. Its harsh scolding and clucking notes were *kee-kee-kee* and *tete! tete!* Soft *coo*'s and *keeho*'s, typical of pigeons, were sounded but less frequently than similar cooings of its less gregarious pigeon relatives. Flapping wings within a huge Passenger Pigeon flock flying overhead made an impressive drumming sound; there was no hint of the Mourning Dove's wing whistle.

CHANGES: The Passenger Pigeon's dramatic plunge

from 3,000,000,000 or possibly 5,000,000,000 individuals circa 1500 to zero in 1914 has been related many times; probably the most complete account is A. W. Schorger's *The Passenger Pigeon, Its Natural History and Extinction* (1955, University of Wisconsin Press, Madison).

More than ten thousand large and small articles—in newspapers, magazines, journals, and books—have been printed on the Wild Pigeon, but remarkably few of them pertain to the bird in Texas. H. C. Oberholser spent years, especially in the 1930's, gathering the history of *Ectopistes canadensis* in the Lone Star State. Most of his information is herewith published for the first time.

H. P. Attwater informed the writer, H. C. Oberholser, that many old residents living in Houston, Harris County, recalled a great Passenger Pigeon invasion in the vicinity of that city during October, 1873. One ranchman said that when he first saw the pigeons approaching in the evening he took them to be black clouds of a great storm from the northeast, while others stated that at times clouds of pigeons darkened the sky. Another person said that it took the pigeons a week to come and another to depart. They were particularly abundant in the Brazos River bottoms of Fort Bend and Brazoria counties, and they left in a southwesterly direction. H. Nehrling also reported that Passenger Pigeons were seen in immense numbers during September and October of 1881 in the vicinity of Houston. G. F. Simmons said that the last individuals in Houston or Harris County were seen between 1890 and 1895; two individuals were taken on upper Galveston Bay at some time in March, 1900. A. B. Hood related that at his ranch in Burleson County close to the Brazos River, on January 17, 1875, the Wild Pigeons were abundant all day and roosted that night in open post oak trees some 3½ miles away. At the same place in 1879 flocks were seen, but flying high in a southwesterly direction; subsequently in 1883 he saw a flock of seven roosting on the trees near his home. J. G. Blaine said that the roost which he found in Leon County some ten miles south of Oakwood occupied about four hundred acres on some hills about three miles west of the Trinity River. The pigeons dispersed each day over the surrounding country hunting acorns, but returned at night from all directions to the same roosting place. During each of the three years that he observed them they remained for about a month or six weeks, departing after exhausting the supply of oak mast, which several varieties of oak produced in abundance.

J. McLemore, during a horseback trip through the western part of Travis County in October or November of 1885, observed scattered flocks of Passenger Pigeons, which he remarked as very wild, probably on account of their having been much hunted. E. W. Kirkpatrick also stated that the birds visited Parker and adjoining counties in great numbers about 1872. H. Nehrling found great numbers in the post oak woods of West Yegua Creek in Lee County during the winter

of 1881, and thousands were seen by hunters at Hearne, Robertson County, during October of the same year. In Lee County, J. A. Singley reported that the species was abundant about 1881, but that no individuals were seen after 1886, when a few small flocks passed through. G. F. Simmons reported, on the authority of Charles D. Oldright and Otto Brinkman, that it formerly was common in the vicinity of Austin, Travis County, occurring during several weeks in both autumn and spring. The last appearance at Austin was a flight of many thousands in the fall of 1878. The pigeons apparently ceased to visit this locality at about the time of their disappearance in other parts of the state—that is, between 1890 and 1895. A. S. Eldredge reported that a flight near Lampasas, Lampasas County, observed during the winter of 1882–83 consumed $3\frac{1}{2}$ hours in passing.

It appears that one of the last great Texas flights occurred during the winter of 1881–82. During that autumn and winter, the Passenger Pigeon appeared in enormous numbers at several points in eastern Texas; there was an immense roost all winter at the head of the Frio Canyon, Real County (Lloyd, 1887, *Auk* 4: 187); there were countless numbers during September and October, 1881, in the post oak woods in the region of Harris County (Nehrling, 1882, *Bull. Nuttall Ornithological Club* 7: 172); during October at Hearne (*Forest and Stream* 17 [1881]: 311); and near Austin (*American Field* 16 [1881]: 298). H. Nehrling wrote that along West Yegua Creek the species “occurred in large flocks of from twenty-five to about two hundred individuals in the post oak woods in the winter of 1881 to 1882. It arrived early in November and remained until February 10.”

Since that winter, it was apparently abundant in only a few places in Texas and is now extinct here as everywhere. It was last detected in Lee County in 1886 (Singley, 1892, *Annual Report Geological Survey Texas* 4: 348); at the mouth of Cream Level Creek in southeastern Van Zandt County in 1896 (*American Field* 46 [1896]: 100); and on upper Galveston Bay in March, 1900 (*American Field* 53 [1900]: 254). Hallie C. James reported that on the edge of a prairie in Hardin County $4\frac{1}{2}$ miles southeast of Kountze, the early settlers found great numbers of Passenger Pigeons roosting in trees.

It is difficult to obtain much firsthand accurate information regarding movements, occurrence, or habits of the Passenger Pigeon in Texas. However, through the helpfulness of Judge Royall R. Watkins of Dallas, the writer obtained information regarding the occurrence of this bird in the northeastern part of the state. Judge Watkins took great interest in game and other birds, and from his own personal experience and from those of a number of his friends and acquaintances, furnished the following facts concerning the Passenger Pigeon in that part of Texas.

The region under discussion is in Henderson County, some eighty-five miles southeast of Dallas and approximately eighteen miles east of the Trinity River,

lying southwest, south, and southeast of the town of Athens. In these directions from Athens and distant about four or five miles, there rise the three branches of Coon Creek, which unite about ten miles south of that town. These three branches lie in relatively wide valleys between low hills and have very little fall; consequently conditions in the bottoms of these rather level-floored valleys are favorable for formation of brushy swamps and bogs of grass and other low vegetation, with alder and other bushes and a few clumps of trees. On the slopes of these valleys which rise away from the creeks is a low growth of oaks (*Quercus texana*, *Q. marilandica*, and *Q. lyrata*), hickories, and similar trees; this has been cleared in places for farming, but in the years before and immediately following 1880, it was nearly continuous over all the upland hills between the creek valleys. Also since Passenger Pigeon days, Coon Creek and its tributaries have been backed up by a dam some twelve miles south of Athens, forming a lake about four miles long called Koon Kreek Lake, the home of the Koon Kreek Klub. This general region includes an area of approximately twenty-five square miles, beginning about five miles south of Athens and extending southward for six miles or more with a width of at least two or three miles, and extending northwest along Coon Creek for a total of about eleven miles to a point five miles southwest of Athens, where the country becomes less rolling and the woods more nearly flat.

Over this terrain the Passenger Pigeon roosted in great numbers, but probably only sparsely populated or entirely avoided the edges of this area and some of the less favorable places. This area was occupied by the pigeons during practically every year from at least 1865 to about 1893, after which time they soon disappeared completely. Judge Watkins reported that 1892 was the last year in which there was a sufficient number of pigeons to make hunting profitable, and there was little hunting done in 1893, although the birds were present in small numbers. He further stated that the birds appeared here usually in October or November in untold thousands—often darkening the sun as they came—and remained on the edges of the marshes and bogs, roosting in the small trees and alder bushes, but spreading also out over the adjacent uplands, where they occupied the trees and bushes. In such enormous numbers were the birds present that many limbs of the oaks and other trees were broken by their weight. Judge Watkins, from 1890 to 1892, saw in the woodlands and swamps of the Coon Creek neighborhood, numbers of these fallen branches. The center of the roost appeared to be on the uplands between the forks of the creek, where the trees were larger, but it is well established that the birds commonly and abundantly used, in addition, the alder bushes in the creek bottoms for roosting purposes. Every morning the birds spread out over the surrounding country for long distances to feed but they returned each night, the flight beginning about an hour before sunset and continuing until dark. They remained every year until late

winter or early spring. There was an abundant supply of acorns and other mast available throughout this region, which undoubtedly was a chief attraction of this particular roost. During the last years when the birds had greatly diminished they were seen coming into some parts of the roost in smaller numbers accompanied by blackbirds.

It is not, of course, possible now to estimate accurately the number of birds that resorted to this roost, but it must have been very great—perhaps 15,000,000 or more. All accounts emphasize that there were so many birds that the farmers and other inhabitants of the region killed large numbers every year, part of which were consumed as food, others fed to the hogs or thrown away spoiled. There is no evidence that any commercial shooting was done at the Coon Creek roost, probably because of lack of storage and transportation facilities. An interesting sidelight, however, on the reasons for persistent shooting of pigeons is contained in the statement of M. D. Murchison, from Houston County. Here also Passenger Pigeons occurred in such numbers at times, that farmers dreaded their coming, because they destroyed the acorn crop, leaving little mast for hogs. The birds were hunted persistently, largely by the use of flares and sticks, since this was the most economical method and did not require expenditure of funds for ammunition.

There was also a roost of Passenger Pigeons—possibly an extension of the Coon Creek roost—about twelve or fifteen miles southeast of Athens, though little information is available regarding this; apparently it was similar to the one already described and was occupied at about the same period. Still other roosts existed on Brushy and Wolf creeks in southeastern Henderson County and extended for an undetermined distance over the line into northern Anderson County. There was also a very large roost covering thousands of acres in southwestern Henderson County in the region south of the town of Malakoff, and west of the Coon Creek roost. At the same time still another roost existed in northwestern Henderson County near Goshen, about four miles northwest of the town of Eustace on Twin, Clear, Caney, and Cedar creeks, and this extended for an undetermined distance westward toward the Trinity River. Thus, it is evident that the Passenger Pigeon roosted over a wide area in Henderson and probably adjoining counties, and that these roosts were occupied year after year, although in varying numbers dependent to a large extent on the supply of acorns. Altogether, therefore, the maximum number of birds involved at these roosts must have been enormous.

Judge Watkins took great pains to inquire of various inhabitants of this region concerning the particulars of the Coon Creek roost, and the following statements from these inhabitants offer additional evidence which corroborates the statements already made.

J. L. Warren gave the following account of the roost situated some fifteen miles southeast of Athens:

"In 1866 my father with his family lived about fif-

teen miles southeast of Athens in Henderson County. The Wild Pigeon invasion of that year was in October and November. Their roosting place was in and around the Caddo marshes, mostly among the button-willows which grew in the marshes. Between the years 1866 and 1873, I do not remember any heavy invasion of the Wild Pigeons, although some few swarms would come in nearly every year. In the early autumn there would frequently be seen what the people called 'spies'; that is, small flocks said to be prospecting for acorns. If there happened to be no acorns on the timber, then no large flocks would follow. These so-called spies would come in small groups of two to three dozen. I do not recall seeing any Wild Pigeons after 1883, and even then the flocks were small compared with some of those of previous years. On their flight to the roost in the evening, the flocks would be so immense as to obscure the sun. The pigeons would clean up an acorn crop in a few weeks and thereafter move on to other sections. Men would frequently go to the roosting place of the Wild Pigeons at night with hunting lamps, sometimes made with fat pine and carried in a frying pan. The light thus made would blind the birds in such a manner that the hunters could thrash them to death by thousands."

W. H. Coleman had the following to say regarding his observations of the pigeons and two additional roosts, one on Brushy Creek and the other on Wolf Creek, both in Anderson County just south of the Henderson County line, and southeast from the Coon Creek roost. His own residence was about 3½ miles southeast of Athens on Coon Creek. He said:

"I have stood on my back porch when a boy and shot Wild Pigeons as they were going to roost. It sometimes took them two or three hours to pass a given point and the stream would be two hundred to four hundred yards wide, sometimes more. They usually came from the northeast and roosted on the break between Shelton and Self Mills [in the Coon Creek roost]. Acres of timber were broken down by their weight. They would come in when the mast began to fall, about the latter part of September, October, and November, and stay as long as the acorns lasted. Parties of men came from as far west as Fort Worth to these roosts for the purpose of hunting, and, aided by the light of a torch, killed them by the wagonload. I have gone with my father to the roosting place and with a light have caught them by the sackfull. The last Wild Pigeons, not over a dozen, that I saw in Henderson County, were in about 1898, and they were feeding with blackbirds on Mine Creek [in the northeastern part of the Coon Creek roost]."

Concerning the roost in northwestern Henderson County about Goshen, Mrs. J. L. Evans, who resided there from 1883 to 1893, reported:

"I first remember seeing the Wild Pigeons in 1883, at which time I was living near the town of Goshen. The country that was occupied by the Wild Pigeon roost, on Clear Creek, Twin Creek, Caney Creek, and Cedar Creek, still is in about the same condition as it

was long ago. The Wild Pigeons stayed in this county all winter. They usually selected a cool, shady place near water, and from 1885 to 1893 they roosted on Twin Creek, two miles north of the present town of Eustace. About 1887, people began to move into this Goshen-Twin Creek area, and in 1890 there was not a single Wild Pigeon left in this vicinity, although west of this area and north to Dry Creek, and southwestward, there were many left.

"During the winter the pigeons fed not only on the acorn crop, but flew into the stock pens, where people fed hogs near the range of the birds, and also fed in great droves in the open oat fields, as well as in the barnyards. I have seen them coming in big droves in the early mornings to eat their breakfast in the barnyards, but at night they always flew back to their roosting place. In 1885 my father was feeding a lot of hogs for the market, and the Wild Pigeons would come in the early mornings in great droves from south of our home from their roosting place on Twin Creek, and eat the grain that my father put out for the hogs. They would fly about the entire premises, eat with the hogs, and drink water from the water troughs for horses and from the water tanks nearby. The pigeons would remain all day among the stock, always busily engaged in feeding. When the stock were fed in the evening, the pigeons were ready to eat all the grain available, and after they had finished their last feeding they would fly back toward the south, whence they had come that morning, to their roosting place on Twin Creek about two or three miles from my house. Frequently the farmers would become so wearied of the depredations of the pigeons on the food intended for the stock that they would kill them in great numbers. Many of the Wild Pigeons raised their young in the region about Goshen, especially between Caney Creek, Clear Creek, and Cedar Creek, where they apparently made themselves at home, going to the same roosting place at night, and flying to nearby barns to eat each morning. They built their nests in big houselike trees, for the most part near their roosting places. The young were always getting big enough to fly by the time the farmers cut the oats, and I used to think that a peculiar coincidence.

"Hunters from all parts of the state would come into the Goshen area, camp in the winter for months, and kill the Wild Pigeons by wholesale. This continued from about 1889 until 1893, when there were no more pigeons to kill."

The above account by Mrs. Evans gives the only information that it has been possible to obtain regarding the breeding of the Passenger Pigeon in this area, but as Mrs. Evans was thoroughly familiar with conditions and with the birds, there seems no reason to doubt the record. Hers also is the only intimation that there was commercial hunting in Henderson County, although as already mentioned there apparently was none in the Coon Creek roost.

H. D. Pickens, who lived about three miles northwest of Athens, observed the pigeons from about 1870

to 1885 in this locality, and he has furnished his recollections:

"They came to us from the southeast each morning flying northwestward. I think they covered the country for twelve or fifteen miles north of here to the edge of the prairie, and returned each evening. Their only food, so far as I know, was acorns, and if the mast failed we did not have the pigeons. If there was heavy post oak mast in October, when the acorns began to ripen, our warning of the approach of the pigeons would be a few small bunches flying around our clearing, occasionally alighting in the trees. Two or three days later the birds would come in from the southeast like a sand storm and would cast a shadow over the earth. We could not see either edge of the flight, nor through them the birds highest above the earth. The low ones would cover the treetops and the higher ones would fly farther on. Then the birds would feed and thrash down the acorns for about two hours, when they too would fly on northward. They would return late in the evening on their way back to the roost. They would continue this for a few days, then alight on the ground and clean up what food there was there. This would last for about twenty or thirty days, which would be the last that we would see of them until the next fall. I well remember that one evening the birds all flew back south never to return again, but we did not think or realize for possibly two or three years that they were gone forever.

"The only roost that I knew of was the one below the Shelton Mill [Coon Creek roost]. I remember that I spent two nights with other boys there shooting pigeons and they seemed to cover the whole country. When we were shooting, we could hear the roar from their wings like distant thunder as far as we could hear in all directions."

A. Ballow, who lived about six miles west of Athens, told of his experiences with the Passenger Pigeon from about 1875 to 1893, which relate chiefly to the Coon Creek roost:

"One of the roosts that I remember well is the one that was located at the Old Shelton Water Mill. The Wild Pigeons would cover an area of some three hundred yards or more wide when they were flying to the roost or leaving. Sometimes when there was a large flock flying over, the mass of birds would darken the earth. They would fly to roost about a half hour before dark and would cover the trees thoroughly. Sometimes there would be so many that they would break a large limb off a tree, and here and there would be trees with practically all the branches broken off by the heavy load of pigeons that had roosted in them."

J. D. Goodgame, whose observations were made about 5½ miles southwest of Athens, added the following information regarding the Coon Creek roost:

"According to my best recollection, the Wild Pigeons were very numerous in this section during the later years of the 1870's and still more numerous during the years of the early 1880's. About 1882 or 1883 the Wild Pigeons were most numerous, but at that

time or soon thereafter they began to diminish, and this continued to such an extent that by about 1886 they had become so scarce that very little attention was paid to them. The roosting area with which I was most familiar was known as the Shelton Mill Break, a tributary of Coon Creek, this being about 5½ miles south of Athens and about 3 miles east of my residence.

"The Wild Pigeons began coming into this range generally late in the autumn and continued here until late in the winter or early spring, when they would disappear until the following autumn. They roosted at night along the marshy creeks, mostly in small clusters of redbud bushes, which grow promiscuously over the marshy lands, and up and down the edge of the marshes. The pigeons, coming in to roost in the late evening, would alight on large trees outside of their regular roosting quarters so thickly that their weight would break down the tops and the limbs of the trees.

"Little heed was paid to the disappearance of the pigeons at that time by a great many people, like myself, who had extensively participated in killing and destroying them by the millions merely for sport. It is a little astonishing that they existed here as long as they did, since the pigeon was used extensively for food and greatly relished."

John M. Criswell, who lived about three miles southwest of Athens, and therefore just north of the Coon Creek roost, related his experience with these pigeons from about 1888 to 1893:

"The Wild Pigeons came into this section of the country about the first of November, 1883, and stayed about two months, or to the last of December. In the evening they would come over from the north on their way south to the breaks to roost in the alders from the old Self Mill place to below the Shelton Mill place. Their crops were full of acorns at evening when they came back from the north, and they were in great flocks like blackbirds. They would alight on the tallest trees to rest before going on to the roost, and I have seen so many on a tree that sometimes the limbs would break. There were no acorns in this country in that year, so they found their food somewhere north of this place.

"In hunting them, some persons would shoot into them at night, but that would scare them and cause them to fly and settle again. Our method was to take our hunting lamps and sacks, and go to the break where the birds roosted. Then by slipping in with the light we could catch all we wanted and put them into the sacks, because in that way they were not disturbed."

Concerning the roost or roosts in southwestern Henderson County south of Malakoff, C. D. Wright, who resided about sixteen miles southwest of Athens, reported:

"The birds roosted in this region over a considerable area on the lands of many of the surveys, and there was another roost east of us [toward the Coon Creek

roost]. The birds came in about October 20 and left about the last of February or the first of March. They came in to us from the west and when they left they passed eastward. They fed on acorns and when there was a large acorn crop there were more pigeons."

Regarding the roosts in the southwestern part of Henderson County, which must have been very extensive and remarkable, George B. Thompson, who resided in that region up to about 1872, contributed the following:

"Southwestern Henderson County was evidently one of the most favored areas as a roost for the Wild Pigeons, since about 1863 there was a roost in this region covering an area of about one thousand acres, reaching south to Wildcat Creek. I can distinctly remember riding along the road in the years 1865 and 1866 and viewing the devastation created by the birds; torn up trees and fallen dead branches, much like the effects of a tornado. The location of this roost in our old cow range was known by the name of 'Pigeon Roost' until I was grown. In about November, 1867, there was a tremendous roost for about a month some five miles north of our place, which was fifteen miles southwest of Athens [thus, this roost was about ten miles southwest of Athens]. I remember that many times when I was on my way to school at about eight o'clock in the morning, a humming sound would begin in the northeast without warning, and in almost no time the horizon would be covered by such a dense cloud of birds that it completely covered the sky east, north, west, and south, with not a white spot of sky showing. So dense was the flight that it made twilight of the morning. The lowest birds flew only about 100 to 150 feet above the ground, literally millions of them, with a drumming sound of their wings, all moving in a southwesterly direction, which created a weird sight, and one that I enjoyed immensely as a small and curious lad.

"My brother and other young men made nightly visits to this roost, returning from twelve o'clock to two o'clock in the morning, bringing the birds by the sack-full. The din of shotguns was like a small battle and so promiscuous was the shooting that it became dangerous. Many of those that had no guns went into the roost with long clubs and joined in the merciless slaughter of the finest birds that have ever been in the south."

In company with Judge Royall R. Watkins, the writer visited on July 31, 1938, the site of the Coon Creek Passenger Pigeon roost above described. Except for small areas of woodlands that had been cleared and were being used as farmers' fields, the aspect of the country was much the same, so the writer was informed, as it was between 1870 and 1890. Many of the larger trees had been removed for firewood or lumber, but on some of the large trees still remaining there was occasional evidence of branches that had been broken off when the trees were much younger—in all probability from the weight of the roosting pi-



PLATE 14: Yellow-shafted Flicker, *Colaptes auratus*

geons. Evidently Henderson County was one of the most important places of rendezvous for the Passenger Pigeon in all of Texas.

G. Hicks of Bandera, Bandera County, stated that during only two years, about 1869 and 1870, did the Passenger Pigeon visit his region in large numbers. During these years they spent the winter and regularly roosted in the trees along the banks of a creek on his ranch that still is called "Pigeon Roost Creek." During the day the pigeons searched for food over the countryside in all directions. Late in the afternoon or early evening before sunset they would start flying into the roost in such large numbers that they even obscured the sun. So great were their numbers that their weight often broke limbs, resulting in the loss of many trees. Apparently they did little harm to anything else in the region.

At night when the birds were at their roost, men killed great numbers, almost entirely with sticks. One man made his living by selling the birds for food during the period of their winter residence.

H. P. Attwater furnished the following information regarding the occurrence of this species in Texas:

"From information furnished me by a number of old settlers in different parts of Texas, the occurrence or visits of the Wild Pigeons in former years to this state were very irregular, and their movements or wanderings on these occasions appear to have been chiefly confined to localities where there was an abundance of acorns, of which there are many varieties in Texas. The acorn crops vary considerably in different years, and like the invasions of the pigeons were very irregular, being very abundant in certain localities in some seasons and scarce in other years.

"In Texas the visits of the Wild Pigeons seem to have been more frequent in eastern and northern counties in the timbered country tributary to Red River. In some years they passed over other parts of the State in day time in continuous flocks for great distances, stopping to roost at night in suitable localities, and remaining for some time whenever favorable feeding grounds were found. They appeared in the fall of the year, generally about the latter part of October, and wandered from place to place in November, December, and January. From the records obtained it would appear that one of the routes followed by the pigeons after crossing Red River into Texas was through the central northern part of the State along the Cross Timbers."

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Head and nape dark gull gray or slate gray; sides of head and chin similar but paler, chin particularly; hindneck rather duller and somewhat brownish with gloss of metallic purple, golden or greenish bronzy purple laterally, greenish medially; back slate gray washed with olive brown; scapulars hair brown or light olive brown with brownish black spots or stripes under edges of feathers; lower back and rump deep to dark gull gray; longer upper tail-coverts more

brownish; middle pair of tail feathers brownish dark mouse gray, darker terminally, next three pairs partly white and partly pale gray, outer pairs white or grayish white, all but central pair of feathers crossed near bases with broad black bar on inner web, and farther toward base of feathers marked on inner web with spot of cinnamon rufous; primaries and secondaries fuscous, primaries edged on middle portion of outer webs with dull cinnamon, dull white, or pale dull brownish gray; wing-coverts mostly neutral gray washed with brown and much spotted with dull black, except on outer feathers; lower abdomen and crissum white; remainder of lower surface russet, vinaceous, or vinaceous fawn color, paler posteriorly; sides more or less washed with gray; lining of wing slate gray. Bill black; iris scarlet or scarlet vermilion; bare space around eye flesh color or red; legs and feet lake red or yellow; claws black. *Adult male, winter:* Acquired by complete postnuptial molt (in September). Very similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Colors much duller than in adult male; head and hindneck more brownish; metallic feathers much duller; back, scapulars, tertials, and inner wing-coverts olive brown; rump, upper tail-coverts, and tail duller and more brownish, scapulars and wing-coverts more heavily spotted with fuscous or fuscous black; anterior lower parts light drab, posteriorly pale drab gray. Bill black; iris orange or orange-red; bare space around eye pale grayish blue; legs and feet paler red than in male. *Adult female, winter:* Acquired by complete postnuptial molt (in September). Like nuptial adult female. *Male, second winter:* Acquired by complete postnuptial molt. Like adult male in winter. *Male, first nuptial:* Acquired by wear from first winter. Like nuptial adult male but sometimes duller. *Male, first winter:* Acquired by partial postjuvenile molt. Like adult male in winter, but with wing-quills retained from juvenile. *Female, second winter:* Acquired by complete postnuptial molt. Like adult female in winter. *Female, first nuptial:* Acquired by wear from first winter. Practically identical with nuptial adult female. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to adult female in winter, but wing-quills of juvenile retained. *Juvenile:* Similar to nuptial adult female, but head and hindneck still more brownish; scapulars tipped with brownish or grayish white, as are feathers of upper tail-coverts; wing-coverts less conspicuously spotted with black, duller and more brownish; lower parts duller, feathers of jugulum and breast tipped with brownish white. Bill black; corner of mouth dull pink; iris light brown, narrow outer ring carmine; legs and feet pale salmon color or flesh color, scales more brownish; claws dull black. *Natal:* Honey yellow, ocher yellow, or Naples yellow; skin dark slate color.

MEASUREMENTS: *Adult male:* Wing, 196.6–214.6 (average, 204.7) mm.; tail, 173.0–211.1 (193.5); bill (exposed culmen), 15.0–18.0 (16.8); tarsus, 25.9–28.9 (27.2); middle toe without claw, 26.4–29.4 (27.7). *Adult female:* Wing, 175.0–210.1 (198.4); tail, 141.5–195.1 (176.8); bill, 15.0–18.5 (16.8); tarsus, 25.4–28.4 (27.2); middle toe, 24.9–28.4 (26.7).

TEXAS: *Breeding:* No eggs or specimen collected, but two reports: Cooke Co., near Gainesville (ca. 1856, fide N. T. Bomar and Joshua Gorham); Henderson Co., near Goshen (considerable numbers remained through summer and nested in large trees, ca. 1883–1892, fide Mrs. J. L. Evans). *Winter:* Records of birds killed in state: Wood Co. (1,015 killed near pigeon roost, ca. Mar. 1, 1881, H. W. Merrill); Van Zandt Co., junction of Cream Level and Kickapoo creeks (a number found and a few shot, 1896, E. A. Wingo); upper Galveston Bay (2 taken, Mar., 1900, fide H. C. Oberholser); Lavaca Co., Hallettsville (small flock encountered and several birds killed, 1864, J. D. Mitchell); Calhoun Co., Wolf Point (taken twice, 1874, J. D. Mitchell). In addition, there were sightings from Young, Jack, Palo Pinto, Wise, Parker, Hood, Tarrant, Johnson, Cooke, Collin, Fannin, Red River, Wood, Van Zandt, Henderson, Anderson, Freestone, Houston, Leon, Robertson, Burleson, Lee, Travis, Jasper, Hardin, Jefferson, Harris, Galveston, Fort Bend, Brazoria, Calhoun, Lavaca, Wilson, Frio, Zavala, Uvalde, Ed-

wards, Real, Bandera, Kerr, Kendall, Gillespie, Mason, Llano, Lampasas, Coryell, Coleman, Mitchell, and Scurry cos.

NESTING: *Nest:* Nearly always in large colonies; in swamps or upland forests, preferably deciduous, but also coniferous trees; in tree or bush, sometimes high above the ground; a rude platform of twigs, without lining. *Eggs:* 1-2, virtually always 1; elongate ovate to elliptical ovate; pure white, rather glossy, unmarked; average size, 38.4×26.9 mm.

WHITE-WINGED DOVE, *Melopelia asiatica* (Linnaeus)

SPECIES ACCOUNT

Zenaida asiatica of A.O.U. check-list, 1957 (see Appendix A). Suggests a heavy Mourning Dove, but has large white wing-band; rounded, white-cornered tail. Largely grayish brown or buffy brown, becoming grayer posteriorly, with purplish sheen on pileum and hindneck; blackish flight feathers; black subterminal tail-band (interrupted on upperside); pale blue orbital skin encircling red (brown in South American birds) eyes. Length, $11\frac{3}{4}$ in.; wingspan, $19\frac{1}{2}$; weight, 6 oz.

RANGE: S.W. United States, south through Mexico and Central America (including many offshore islands) to Costa Rica; w. Panama (south coast) and along Pacific coast of South America from s. Ecuador to n. Chile; also West Indies. Northern mainland populations winter chiefly along Pacific slope from s.w. and s. Mexico to Costa Rica; individuals may wander in migration north as far as U.S.-Canada border (accidentally) and east to Florida (sparingly).

TEXAS: (See map.) *Breeding:* Early May—a few in Apr.—to late Aug.—locally into Sept. (eggs, Apr. 16 to

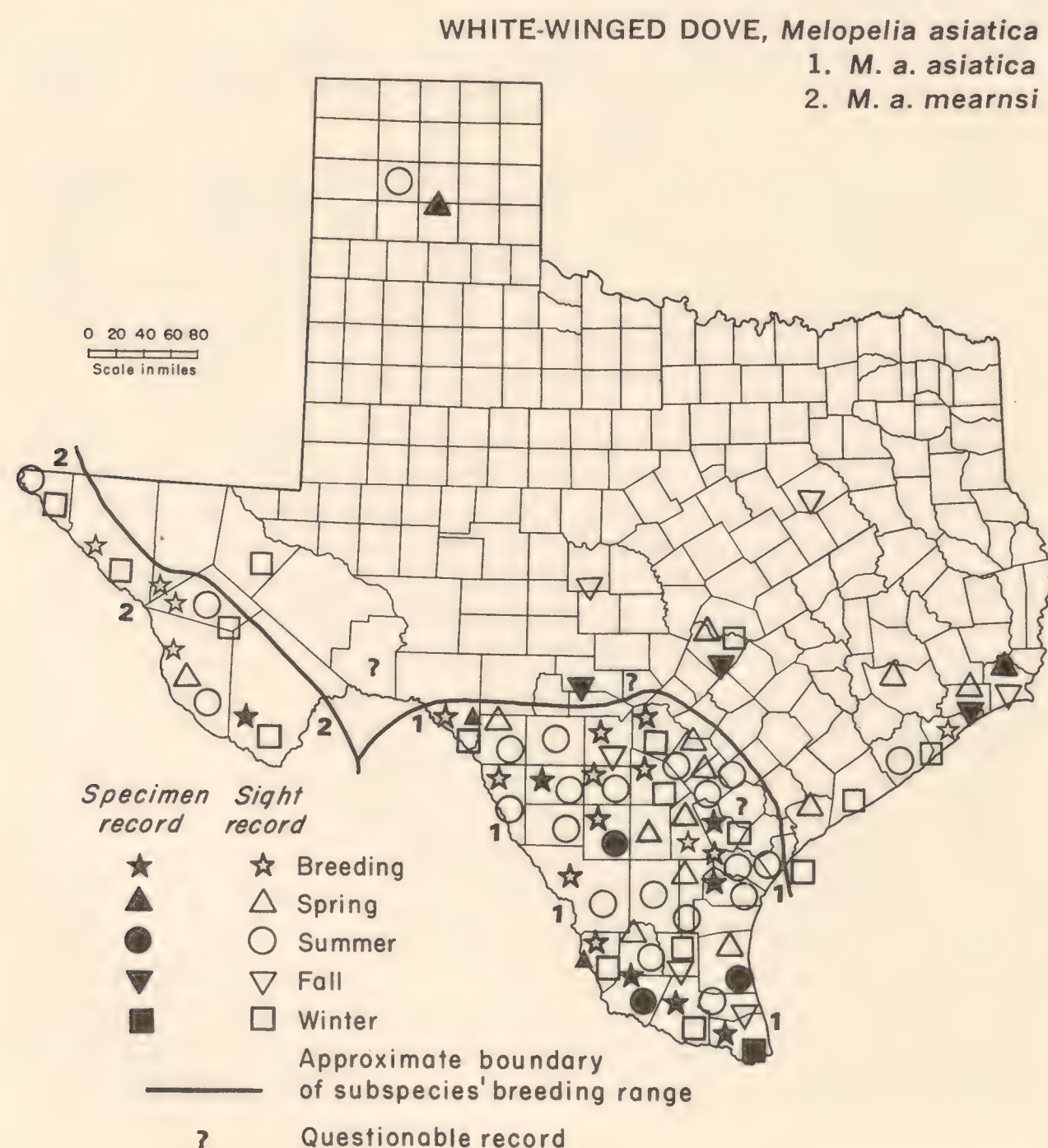
Aug. 13; young in nest as late as Sept. 5) from near sea level to 5,500 ft. Common locally (formerly abundant generally) in Rio Grande delta and upriver to Laredo; fairly common to uncommon about towns in remainder of Tamaulipan Biotic Province north to Del Rio, Uvalde, Concan, San Antonio, and Beeville; fairly common from Big Bend locally upriver to El Paso (nesting likely); uncommon on Galveston Island. *Migration:* Late Mar. to mid-May; late Aug. and Sept. to mid-Nov. (extremes: Feb. 26, early June; July 14, Nov. 25). Common to uncommon through breeding range; rare in Trans-Pecos away from Rio Grande, in central portions, and from Rockport to Houston and Cove; casual in northern third. *Winter:* Late Oct. to late Mar. Scarce to rare and irregular in most of breeding range; casual in Reeves, Travis, and Matagorda cos.

HAUNTS AND HABITS: Tall ebony-mesquite-prickly-pear cactus brushland near the Rio Grande from Laredo to the river mouth is the prime Texas habitat of the White-winged Dove; citrus groves are accepted to some extent, but the trees must be old and leafy. North of the southern tip of the state, Whitewing pairs occur chiefly in pecan, ash, live oak, and other shade trees in towns. Surrounding mesquite rangeland is used by Mourning and Ground doves; these two species are not numerous in those towns where White-winged and Inca doves flourish. In the Trans-Pecos, White-wings are attracted to willow-cottonwood-saltcedar (tamarisk) associations either along the Rio Grande or in towns. Where a sizable grove of trees is found, these birds nest in colonies; otherwise pairs scatter to suitable habitat. Even during the breeding season, groups gather to feed; but especially in late summer and early fall, large flocks of adults and young congregate at feeding and watering sites.

When the Whitewing takes to the air, its wings sometimes make a clapping noise, but there is only a suggestion of the Mourning Dove's definite whistle. Underway, flight is noiseless, swift, direct, and appears effortless. Except in those towns where it is a long-established nester, this bird is wary and easily alarmed, even more so in areas where it is hunted. Gatherings of Whitewings forage in shelter of thickets, weeds, or fields for seeds (doveweeds, spurge, sunflowers, grains, wild grasses, cacti, and mesquites are a few favorites), berries, and a few insects; after feeding, individuals retire to a tree or heavy brush.

White-winged Dove males move to a more or less open perch in early morning during the breeding season where they utter two common vocalizations: a burry *coo-uh-cuck-oo* and a *who cooks for you?* (which suggests the call of the Barred Owl). This species is most vocal from mid-April to mid-August; during the nesting season in favorable years, some south Texas towns, notably Beeville, sound like enormous dove cotes.

CHANGES: From 1870 to 1920, settlers agreed that there were several million White-winged Doves in the Rio Grande delta and upriver to Laredo. Wholesale clearing of Whitewing nesting brush began in the



1920's. Also during this period, increasing hordes of hunters held contests to determine who could kill the most Whitewings; one hundred birds per hunter per day was considered only fairly good. By 1930, the first decline in this bird's population became visible. Up-river, however, in Starr, Zapata, and Webb counties, conditions remained almost pristine. A trip from Laredo to Rio Grande City at any time during the 1930's was like going through a fabulous wildlife preserve. All the way—102 miles—the traveler was surrounded by high dense thornbrush—huisache (*Acacia farnesiana*), black brush (*Acacia rigidula*), Texas ebony (*Pithecellobium flexicaule*), mesquite (*Prosopis glandulosa*), and head-high pricklypear cactus (*Opuntia lindheimeri*). Each of these plants bloomed yellow, usually fragrant, flowers which ripened into nutritious seeds. It was a paradise for rattlesnakes, pack rats, peccaries, pigeons, and doves. Especially in late August and early September, would singles, pairs, groups, lines, and great flocks of Whitewings fly high over this teeming brush; lesser flocks of big Red-billed Pigeons would sometimes fly near the doves. Between 1940 and 1950, almost all this terrain was converted to farms and cleared cow pastures. Instead of thousands of Whitewings of the 1930's, the traveler over the same route in the early 1970's did well to see ten Whitewings. Needless to say he saw no Red-billed Pigeons.

With native brush—especially the very most favored *ebanales* (ebony groves)—reduced to a few scattered trees, Whitewings began nesting in mature citrus groves. Just as wildlife biologists were beginning to rejoice at the degree of adaptation—80 percent of the doves were nesting in citrus in 1950—there descended on January 29, 1951, a ferocious norther that in three days froze 85 percent of the large citrus trees. In 1950, Rio Grande delta Whitewings numbered 1,039,000; after the freeze only 110,000 nested in the delta and nearly all these returned to remnants of native brush. Since 1951, the dove has recovered somewhat, but it can never return to anything approaching its former abundance because brush fragments and even citrus groves—periodically killed by freezes—continue to decrease. In addition, soil, water, and air of the delta from the 1950's on have been increasingly saturated with agricultural pesticides and herbicides.

Since wildlife future is so dim in the southern tip of the state—and for one hundred miles into Mexico where conditions are similar—perhaps Whitewing prospects in and near Texas rest with the 5 percent of the population which nest in upper south Texas. However, in Del Rio, Eagle Pass, Uvalde, Pearsall, San Antonio, and Beeville the shade tree colonies mostly appeared less flourishing in the early 1970's than they did in years previous. Probably the twentieth century will prove too much for even the rather adaptable White-winged Dove!

For extremely detailed data on the history, status, management, and mismanagement of this dove in Texas and elsewhere throughout its range, the reader is referred to *Whitewings*, edited by Clarence Cottam

and James B. Trefethen (1968, H. D. Van Nostrand Co., Inc.).

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN WHITE-WINGED DOVE, *Melopelia asiatica* *asiatica* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead fawn color, sometimes tinged with gray; crown and occiput dull vinaceous drab or rather dark purple drab, lower part of hindneck lighter, sometimes more grayish; back, scapulars, inner secondaries, and wing-coverts dark buffy brown or saccardo umber; rump and lower back similar but more or less mixed with dull neutral gray; upper tail-coverts and middle pair of tail feathers like back but rather more rufescent; remainder of tail slate gray, with irregular sub-terminal band of slate black or brownish slate, and very broad tip of white; alula and primary coverts, primaries, and all but innermost secondaries fuscous black or chaetura black, edges of second and third primaries white on middle portion, secondaries broadly tipped with white on outer webs, inner wing-coverts like back, outer ones light hair brown or mouse gray, most of them broadly tipped with white, forming large white wing-patch; sides of head and of neck, chin, and throat wood brown, somewhat whitish on anterior part of chin; sides of neck glossed with light metallic yellowish olive; conspicuous spot below ear-coverts black or blue black with more or less steel blue sheen; tinged with vinaceous on jugulum and breast; posterior lower parts gull gray or pale neutral gray, anal region whitish; sides and flanks darker gray; under surface of tail slate black, broadly tipped with white; lining of wing neutral gray. Bill black; iris orange, orange-red, brownish orange, dark brown, or red; bare orbital space pale grayish blue; legs and feet lake red, dark carmine, or coral red. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but colors darker and richer. *Adult female, nuptial:* Acquired by wear from winter. Like nuptial adult male, but usually rather duller, with less purplish on head and hindneck; rump more brownish; metallic gloss on sides of neck duller and less evident; anterior lower parts duller. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but colors darker and richer. *Male and female, first winter:* Acquired by postjuvenile molt. Very much like corresponding adult in winter. *Juvenal:* Acquired by complete post-natal molt. Similar to nuptial adults, but much more grayish; hindneck and back mouse gray; scapulars and lesser wing-coverts narrowly edged with light brownish gray; no metallic gloss on sides of neck; black spot below auriculars reduced in size; jugulum and breast drab gray with obscure narrow lighter shaft streaks. *Natal:* Dull white or buffy white.

MEASUREMENTS: *Adult male:* Wing, 144.5–166.1 (average, 156.2) mm.; tail, 97.1–115.1 (103.4); bill (exposed culmen), 18.0–22.6 (19.8); tarsus, 23.6–25.9 (24.6); middle toe without claw, 23.1–26.4 (24.6). *Adult female:* Wing, 142.0–161.0 (151.4); tail, 84.6–106.4 (98.3); bill, 17.5–21.6 (19.3); tarsus, 22.1–25.4 (23.6); middle toe, 22.1–24.9 (23.6).

RANGE: S. Texas, south through e. Mexico to Chiapas and Quintana Roo; also s. Bahamas, Haiti, Jamaica. Winters mainly from Oaxaca and Chiapas to Costa Rica.

TEXAS: *Breeding:* Altitudinal range, near sea level to 950 ft. Collected northwest to Val Verde, east to Bee, south to Cameron, Hidalgo, Starr, and Zapata cos. Common locally. *Migration:* Collected northwest to Armstrong, east to Travis and Chambers, south to Cameron cos. *Winter:* Taken in Cameron Co. (3 specimens).

NESTING: *Nest:* In brushy pastures, brush, woods, and shade trees; in bush, tree, tangles of vine, or cactus; frail platform with slight hollow for eggs; composed of twigs, weeds, and grasses, sometimes of Spanishmoss; lined, if at all, with leaves, bark, and feathers. *Eggs:* 1–3, usually 2; elliptical oval or oval; smooth, not glossy; pure white, dark cream color, or buff; unmarked; average size, 29.7 × 22.1 mm.

WESTERN WHITE-WINGED DOVE, *Melopelia asiatica mearnsi* Ridgway

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *M. a. asiatica* but larger; upper and lower parts lighter and more grayish; jugulum and breast light drab to hair brown; back and scapulars hair brown to deep drab.

MEASUREMENTS: *Adult male:* Wing, 151.9–171.4 (average, 164.3) mm.; tail, 101.1–121.4 (114.8); bill (exposed culmen), 18.5–23.6 (22.6); tarsus, 23.6–29.4 (25.4); middle toe without claw, 23.9–27.4 (26.2). *Adult female:* Wing, 150.1–169.9 (158.8); tail, 95.0–116.1 (105.6); bill, 19.6–23.9 (22.1); tarsus, 22.1–25.9 (23.9); middle toe, 23.1–27.4 (24.1).

RANGE: S.e. California and s. Nevada to s. Trans-Pecos Texas, south through Baja California (except Cape region) and w. mainland Mexico to Guerrero; also many islands off Mexico's west coast. Winters from Sinaloa to Isthmus of Tehuantepec.

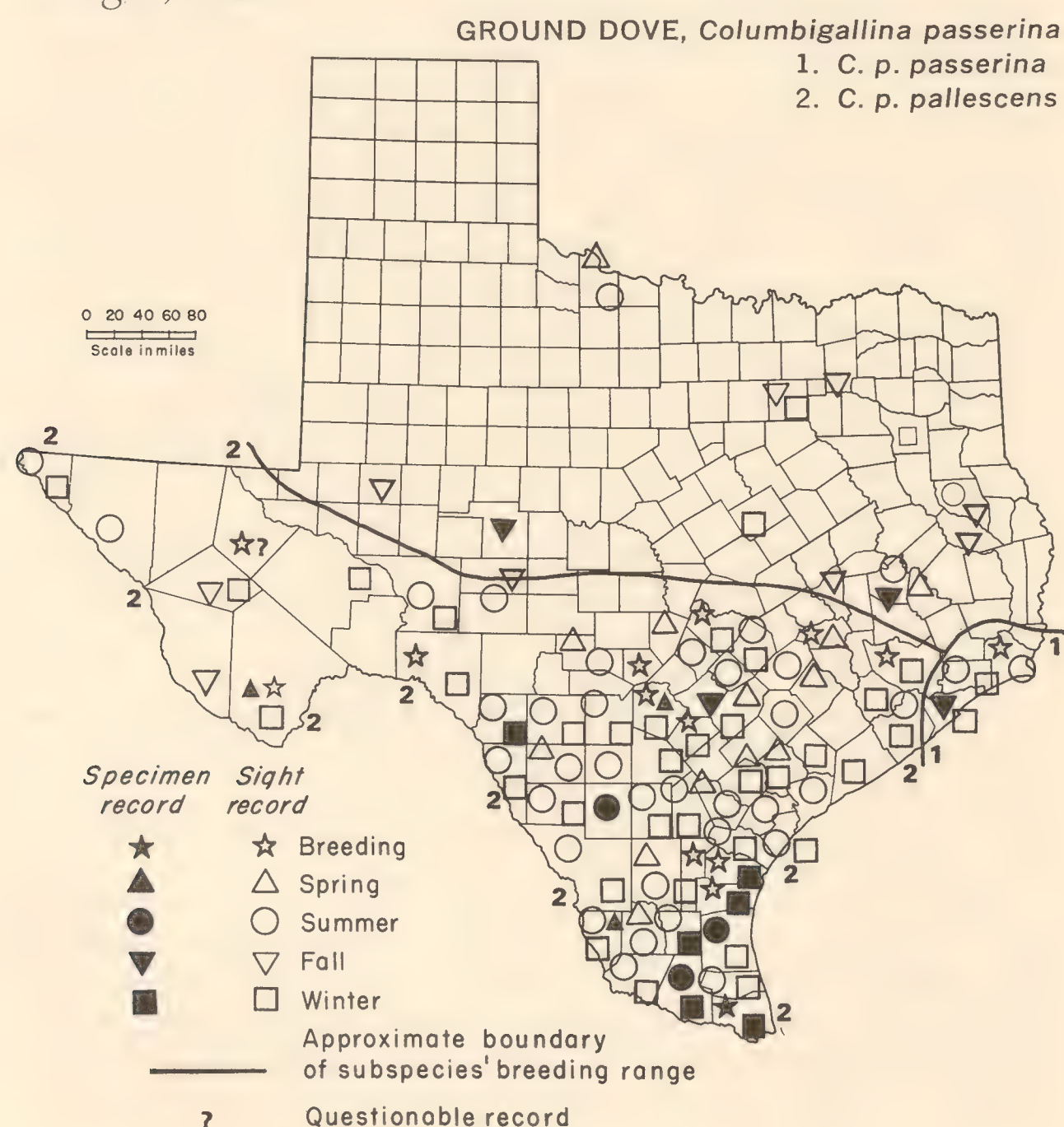
TEXAS: *Breeding:* Altitudinal range, 2,000 to 5,500 ft. Collected in Brewster Co. Fairly common locally.

NESTING: *Nest:* In desert or cultivated lands, brush, or along roads; in bush or tree; slight platform of twigs, grass, weed stems, and straw; lined with fine twigs and similar materials. *Eggs:* 1–3, usually 2; shape and color similar to those of *M. a. asiatica*; average size, 30.1 × 23.4 mm.

GROUND DOVE, *Columbigallina passerina* (Linnaeus)

SPECIES ACCOUNT

Common Ground Dove of various authors. A tiny, chunky dove with stubby, blackish tail; broad, rounded wings. Essentially grayish brown above with blue-black wing-spots; pinkish brown below; liberally barred (imparts scaly effect) on head, neck, and breast with dark brown; dusky-tipped reddish or yellow bill; red eyes. In flight (rapid), wings display rufous on primaries and linings. Length, 6¾ in.; wingspan, 10¾; weight, 1¼ oz.



RANGE: S. United States, south through Mexico (including Socorro and many offshore islands) to Costa Rica, and from Colombia and Venezuela (including Aruba, Isla Margarita, and Trinidad) to Ecuador and n. Brazil; also Bermuda and West Indies.

TEXAS: (See map.) *Resident:* Breeds, mid-Mar. to late Oct. (eggs, Mar. 30 to Oct. 8) from near sea level to probably almost 4,000 ft. Common to uncommon throughout south Texas, west to Big Bend, north to Austin, and east to central coast; scarce in remainder of Trans-Pecos, on Edwards Plateau, and north along coast to Houston-Galveston vicinity; rare and local in most of southeastern portion, north apparently to Angelina and Nacogdoches cos. *Vagrant:* Rare near Waco; casual in north central Texas. Recent records from Midland Co. (seen, Oct. 5, 1972, Midge Erskine, Frances Williams) and Tom Green Co. (specimen, not identified to race but probably *C. p. pallescens*, Oct. 15, 1972, Terry Maxwell).

HAUNTS AND HABITS: The Ground Dove is the smallest, most compact member of its family native to the United States. In the southeastern part of the nation, it is nowadays a bird of farmland situations: dirt and gravel roads, sparse woods with low undergrowth, weed patches, fallow fields, orchards, and the vicinity of farm houses and dwellings in towns. In Texas, however, Ground Dove habitat is quite different. Here the Inca Dove occupies the cultivated areas just described, leaving brushy rangeland to the present species. Largest piece of prime habitat left in the United States for the Mexican Ground Dove, as well as much other subtropical fauna and flora, is the nearly one-million-acre King Ranch located chiefly in Kleberg and Kenedy counties. Here on the grassy mesquite-live oak-cactus savannah, Ground Doves approach maximum population densities. During the 1940's and 1950's, King Ranch game manager, V. W. Lehmann, often joked to visitors from the north about the ranch's huge crop of "baby mourning doves." In almost any other part of the state, genuine baby Mourning Doves, in season, are more numerous than adult Ground Doves! *Columbigallina passerina* also lives to some extent in scrubby juniper-oak situations in the Trans-Pecos and on the Edwards Plateau. The species occurs singly, in pairs, or in small companies.

When the bird rises, its wings often make a soft, whistling sound, although very much less noticeable than the wing whistle of the Mourning Dove. The Ground Dove usually flies low for short distances, seeking, especially when startled, the first available cover. Favored perches are on a fence, low tree branch, pricklypear cactus, or stone. Most time, however, is spent on the ground in search of small seeds, a few wild berries, and whatever insects happen to turn up. It walks easily on short legs, sometimes with considerable speed, nodding its head and often raising its tail; sometimes it strolls with elevated tail for several yards. Not generally shy, this dove may easily be approached.

A monotonous *woo-oo, woo-oo*, etc., is the Ground

Dove's territory-courtship call; heard from a distance the two syllables merge into a *woo* (*wuh*, according to some listeners) with a rising inflection. Apparently the call is nearly always delivered from a perch a few feet or yards above ground level. Calling occurs chiefly during the breeding season.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN GROUND DOVE, *Columbigallina passerina passerina* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead light grayish vinaceous; crown, occiput, and hindneck dark bluish gray, feathers with narrow slate-colored tips that give squamate effect; remainder of upper surface hair brown to dark drab; middle pair of tail feathers hair brown, rather darker terminally; remainder dull black or fuscous black, all but outer ones basally more or less extensively hair brown or brownish slate gray, outermost narrowly tipped with white, chiefly on outer web; primaries, outer secondaries, and primary coverts chestnut or chestnut rufous, tipped and edged terminally with fuscous or fuscous black, secondaries wholly so on outer webs; inner secondaries mostly fuscous, but basal portions of inner web chestnut rufous; tertials like back, sometimes with metallic dull purple spots; wing-coverts light grayish vinaceous, sometimes more or less tinged with gray and with a few spots of metallic dull purple or dull blue; sides of head and of neck, chin, and throat light grayish vinaceous, feathers slightly darker on margins; jugulum and breast pinkish light purple drab, becoming more brownish on abdomen, feathers with broad fuscous centers which produce spotted or squamate effect; lower tail-coverts hair brown, edged with light brownish gray, sometimes washed with vinaceous; lining of wing chestnut rufous. Bill deep pink, dull carmine, or yellow, tip dull brown or black; eye-ring greenish white; iris red, rose pink with narrow lighter ring next to pupil; legs and feet yellow or pale flesh color. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Similar in pattern of coloration to nuptial adult male but darker and duller above; forehead dull smoke gray; rest of upper surface hair brown, upper tail-coverts somewhat darker, hindneck a little grayish, the latter, together with pileum, with scalelike tips of dark brownish slate color; tail and wings like those of adult male, but wing-coverts lack any tinge of vinaceous, dark spots on coverts and tertials mostly dull dark coppery bronze instead of purple; sides of head dull buffy or grayish white, finely but obscurely streaked or spotted with scalelike markings; chin dull white; sides of neck, throat, jugulum, and upper breast mixed light drab and pale mouse gray, with large central feather spots of deep mouse gray, giving whole area a scaled effect; sides and flanks rather light drab, with a dash of chestnut on former; middle of breast and upper abdomen dull pale brownish smoke gray; abdomen white; lower tail-coverts centrally hair brown, broadly margined and tipped with pale smoke gray; lining of wing and axillars chestnut. *Adult female, winter:* Acquired by complete postnuptial molt. Practically same as nuptial adult female. *Male and female, first winter:* Acquired by complete postjuvenile molt. Similar to adult male, but upper parts, particularly head and neck, more brownish; wing-coverts drab gray instead of vinaceous; metallic spots on wing-coverts, scapulars, and tertials duller, more brownish, and less metallic bluish or purplish; sides of head and of neck and entire lower parts drab gray; chin and upper throat whitish; chestnut of wings more restricted, particularly on outer webs of primaries. *Juvenile:* Acquired by complete postnatal molt. Similar to nuptial adult female, but upper parts rather darker and duller, back, scapulars, wing-coverts, rump, and upper tail-coverts tipped with brownish white or grayish white; wing spots duller and without metallic gloss; greater coverts edged with cinnamon; most of wing-coverts with cinnamon shaft streaks; lower parts duller, rather darker; spots and squamations of jugulum and

breast less distinct. *Natal:* Long hairlike down dull gray both above and below.

MEASUREMENTS: *Adult male:* Wing, 84.1–88.9 (average, 86.1) mm.; tail, 58.9–65.0 (62.0); bill (exposed culmen), 10.9–11.9 (11.4); tarsus, 15.0–17.0 (16.0); middle toe without claw, 14.0–15.7 (15.0). *Adult female:* Wing, 85.1–87.9 (86.6); tail, 55.1–63.0 (59.9); bill, 11.4–11.9 (11.7); tarsus, 15.0–17.5 (15.7); middle toe, 14.2–16.0 (14.7).

RANGE: Locally from extreme s.e. Texas to s.e. North Carolina, south to s. Florida (including Keys).

TEXAS: *Resident:* Altitudinal breeding range, near sea level to about 50 ft. One specimen: Galveston Co., Hulen (ca. Oct. 1, 1896, identified by A. K. Fisher). Nest with young found: Harris Co., Alameda (June 1, 1910, G. F. Simmons). Rare and local. *Vagrant:* One specimen: Kleberg Co., King Ranch (Feb. 8, 1947, I. N. Gabrielson).

NESTING: *Nest:* In woodlands, cultivated areas, or even on beaches; in bush, vine, or tree, on pricklypear cactus or stump; a flimsy platform of twigs, grass, rootlets, or pine needles, lined with somewhat finer but similar materials; sometimes a sparsely lined hollow in sand on the ground. *Eggs:* 2–3, usually 2; elliptical oval to ovate or oval; smooth, but not glossy; pure white, unmarked; average size, 21.9 × 16.3 mm.

MEXICAN GROUND DOVE, *Columbigallina passerina pallescens* (Baird)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. p. passerina* but decidedly paler, upper surface more grayish; in male, head, neck, and anterior lower surface lighter and less reddish (more grayish) vinaceous; also bluish gray of occiput paler. Basal portion of bill in life red, instead of yellow or orange.

MEASUREMENTS: *Adult male:* Wing, 83.1–90.9 (average, 87.1) mm.; tail, 56.9–63.0 (59.4); bill (exposed culmen), 10.9–11.9 (11.4); tarsus, 15.0–16.0 (15.5); middle toe without claw, 14.0–15.5 (14.7). *Adult female:* Wing, 84.1–89.9 (86.6); tail, 56.9–62.0 (58.9); bill, 10.9–11.9 (11.4); tarsus, 15.0–16.0 (15.5); middle toe, 15.0–16.0 (15.5).

RANGE: S. California to c. Texas, south through Baja California and mainland Mexico to Guatemala and British Honduras.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 3,700 ft., probably higher. Collected north to Bexar and Guadalupe, south to Nueces and Cameron, west to Zapata, Kinney, and Brewster cos. Fairly common. *Vagrant:* One specimen outside breeding range: Walker Co., 2 mi. southwest of Huntsville (Nov. 7, 1936, V. W. Lehmann).

NESTING: *Nest:* Similar to that of *C. p. passerina*, but usually placed in mesquite-cactus brush. *Eggs:* 1–2, usually 2; elliptical oval; pure white, unmarked; average size, 21.6 × 16.5 mm.

RUDDY GROUND DOVE, *Columbigallina talpacoti* (Temminck)

SPECIES ACCOUNT

Also known as Talpacoti Dove. *Male:* cinnamon with chestnut crissum; lacks scaly appearance; has pale bluish gray head; dull red and black bill; reddish orange or orange-yellow eyes (A. Wetmore); pink feet. *Female:* duller than male, but richer brown than other female ground doves. Length, 6¾ in.; weight, 1½ oz.

RANGE: S. Sinaloa and s. Tamaulipas, south through lowlands of Mexico, Central America, and n. South America (including Isla Margarita, Trinidad, and Tobago) to n. Argentina.

TEXAS: *Casual:* Five sightings, one substantiated by

color photographs: Cameron Co., Harlingen (Dec. 23, 24, 1950, L. I. Davis, L. C. Goldman, and W. S. Jennings); San Patricio Co., Welder Wildlife Refuge (Dec. 2, 1957, Clarence Cottam); Dimmit Co., near Carrizo Springs (1 perched on ranch fence, Apr. 14, 1970, Linda Snyder); Cameron Co., Laguna Atascosa Nat. Wildlife Refuge area (1 near main entrance, Apr. 21, 1970, J. A. Lane, et al.). Hidalgo Co., Santa Ana Nat. Wildlife Refuge (1 present, Jan. 28–Mar. 18, 1971, discovered and photographed by W. A. Shifflett; bird viewed by at least 100 qualified observers; photos on file at Santa Ana, also photo no. 32 in Texas Photo-Record File, Texas A&M University).

HAUNTS AND HABITS: The Ruddy Ground Dove generally requires a definitely more tropical and somewhat more humid climate than does the Common Ground Dove. In the region of Xilitla, San Luis Potosí, it seems to prefer the valley of the Río Axtla. Here, where the original Mexican spine palm (*Acrocomia*) and strangler fig (*Ficus*) forest has been chopped and burned down, there now grow patches of coarse grass intermingled with bull's horn acacia and various other second-growth shrubs. At river's edge are clumps of giant bamboo, an old naturalization from the Orient. This is a prime haunt for both the Ruddy Ground Dove and Gray-headed Ground-chat. Why the dove has been sighted more—and the ground-chat less—within the Rio Grande delta in recent years is a bit of a mystery.

Columbigallina talpacoti is often seen walking with the usual dove-pigeon nods of the head. On the wing, usually in pairs or small flocks, it flies rapidly but low—only a few feet—above the ground. It would seem unlikely that this nonmigratory species would stray to the United States. However, with Wayne Shifflett's 1971 photographs at Santa Ana, the evidence for its occurrence became conclusive. Since the Ruddy Ground Dove is not a popular cage bird, it is most probable that the Texas sightings were of wild birds.

Call of *C. talpacoti* is a soft *hoo-toot*, more definitely two-syllabled than that of the Common Ground Dove (E. P. Edwards).

NOTE: Since subspecies cannot be safely identified from photographs, there follows no detailed plumage description of the present species.

INCA DOVE, *Scardafella inca* (Lesson)

SPECIES ACCOUNT

A small, pale, long-tailed dove with an overall scaly appearance. Brownish gray upper parts; whitish under parts; profusely barred above and below by dark brown feather-tips; blackish bill. In flight, narrow, square-tipped tail (appears pointed when tightly folded) shows white sides; wings flash chestnut on primaries and linings. Length, 8½ in.; wingspan, 11¼; weight, 1¾ oz.

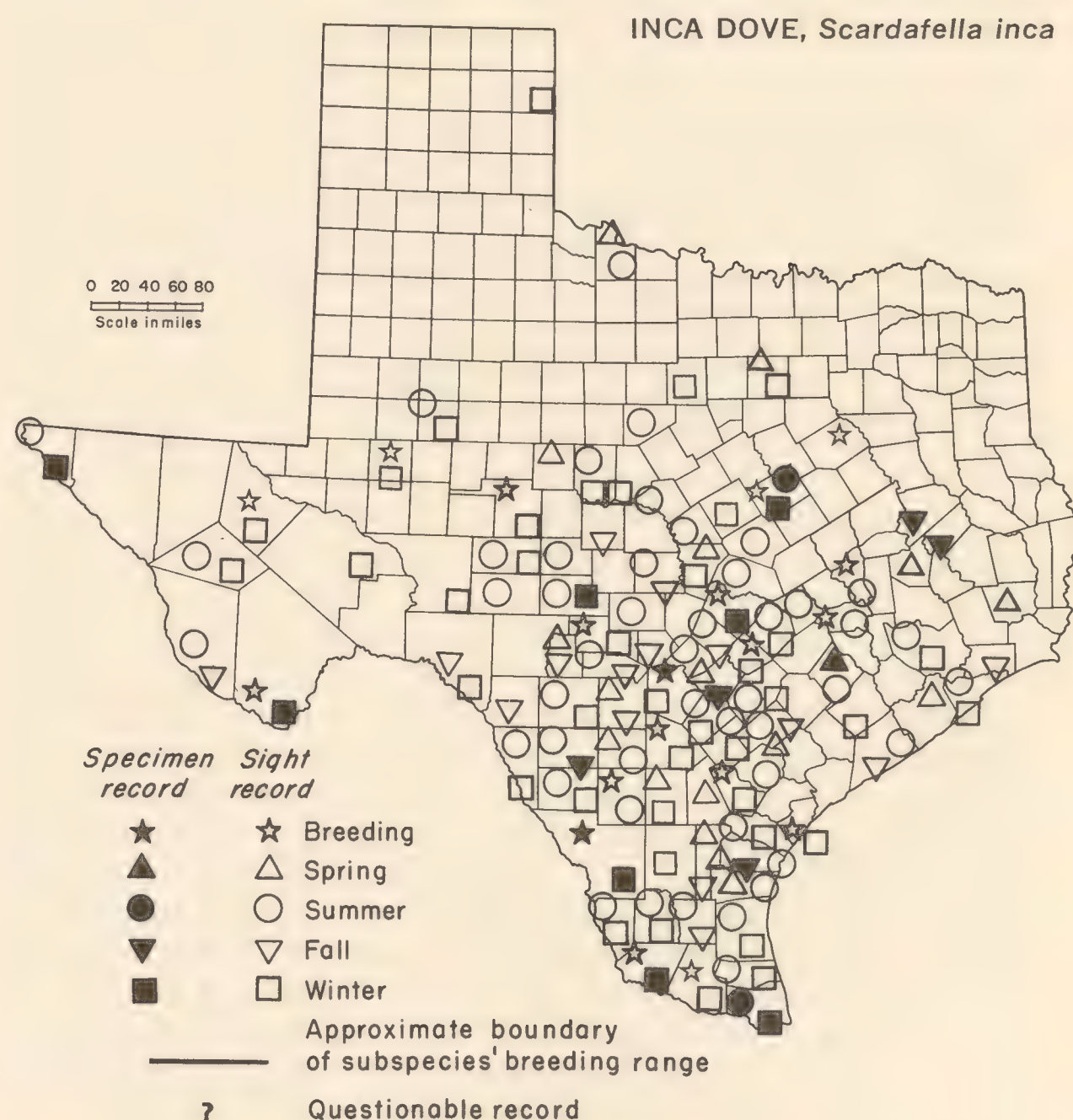
RANGE: C. Arizona, s. New Mexico, and c. Texas,

south through Mexico (except Gulf states of Yucatán Peninsula) to extreme n. Costa Rica.

TEXAS: (See map.) *Resident:* Breeds, late Feb. to late Dec. (eggs, Mar. 12 to Oct. 30; young in nest as late as Dec. 26) from near sea level to about 5,000 ft. Locally common to fairly common throughout south Texas northward to Del Rio, San Angelo, Coleman, Lampasas, and Austin, and eastward to Galveston; common at El Paso; uncommon to scarce and decidedly local in most of remaining southern two-thirds north to Balmorhea, Midland, Big Spring, Fort Worth, Corsicana, and southwestern Houston Co. near Huntsville; rare along Oklahoma and Louisiana borders (nesting unconfirmed).

HAUNTS AND HABITS: In the Southwest, the Inca Dove lives chiefly in the vicinity of human habitations: poultry and livestock feed lots, yards, gardens, orchards, school grounds, city parks; it is also seen along roads through brushy mesquite pastures, but very seldom out of sight of houses. Probably Roy Bedichek in *Adventures with a Texas Naturalist* pointed up better than anyone else the extreme domesticity of this tame dove. In chapter 6, he abundantly illustrated why in Texas the Inca Dove and Mexican (pink) evening primrose (*Oenothera speciosa*) are the bird and wild flower which creep right up to your door. It is perhaps a remarkable coincidence that on the other side of the world, in southeastern Asia—and introduced into Hawaii—there resides the Barred Dove, *Geopelia striata*, similar in size, shape, and even plumage to the Inca, which is equally or possibly even more attracted to the buildings of man.

Flight of the Inca is quick and jerky. Wings, especially when the dove is flushing, make a *flutting* sound which is unique among U.S. birds. When disturbed, it flies to a tree or bush where it perches, typically with



long tail drooping; here also it roosts at night. During cooler months, several roosting Incas may huddle together shoulder-to-shoulder and sometimes double-decker. Feeding almost entirely on the ground, the bird pecks for weed and grass seeds and waste grain, especially poultry feed. With chickens, the Inca consumes grit and drinks water; the dove gets fluid down faster because it doesn't have to lift its head to let each sip trickle down its throat. As it strolls around its feeding territory, this dove, like others, usually holds its head erect but nods it back and forth as it steps along.

The Inca Dove's call is a monotonous *ooh-coo* (or *ball two*, as interpreted by Anna May Davis); each note is of nearly equal emphasis. On very warm, still days—especially clear ones—from late February into August, *ball two*'s (or *no hope*'s, according to persons who profess to being oppressed by hot weather) issue almost continuously from dawn till dusk. Besides the common note, the bird sounds an occasional *coo-co-hoo* and *hink-a-doo* (L. I. Davis). Skirmishing males exchange angry sounding growls when they are defending breeding territory.

CHANGES: In addition to creeping up to doors, the Inca Dove has gradually crept northward from Mexico and south Texas with increasing settlement of the land. In San Antonio, the first specimen was taken April 15, 1890 (H. P. Attwater); by November 1, 1904, the bird was common throughout the suburbs and country surrounding this city (Vernon Bailey). Within Kerr County, a pair was encountered on February 6, 1900, and several on February 29, 1901 (Howard Lacey); eggs were found on May 12 and 13, 1938 (F. F. Nyc, Jr.). At New Braunfels (Comal Co.) it was abundant in 1903, but not known a few years previously (A. E. Schutze). The Inca had made its debut in Austin by October 23, 1889, when one was shot from a flock of three (C. D. Oldright). First collection in Waco was October 6, 1903, and the species was found nesting there in 1906 (J. K. Strecker). In the Fort Worth vicinity, a single bird appeared on November 24, 1955 (W. M. Pulich, W. Smith). Near the Red River Valley at Vernon (Wilbarger Co.) a pair was observed July 30, 1938, and on several other occasions during the spring of the same year; also other individuals had been noted regularly for the previous fifteen years (R. L. More). The most northern Texas record seems to be one seen at Canadian (Hemphill Co.) in the northeastern Panhandle, December 22, 1966 (J. L. Rowlett).

Since 1954, a few birds have been seen north of Texas in Oklahoma, and even in Kansas in 1957 and 1965 (see G. M. Sutton, 1967, *Oklahoma Birds*, pp. 235–236). Oddly enough, individual Inca Doves usually enter a new territory in cold months; this behavior occurs also in other ordinarily hot-country birds, such as the Cattle Egret and Groove-billed Ani.

DETAILED ACCOUNT: No SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead pale ecru drab; remainder of

upper surface grayish drab or light hair brown, sometimes more rufescent on back, and everywhere barred by fuscous tips of feathers; middle pair of tail feathers fuscous or light olive brown, remainder of tail dull black or fuscous black, three outer pairs of feathers with long terminal white areas; primary coverts and primaries chestnut, tips and terminal portion of outer webs of primaries fuscous; secondaries fuscous, the outermost chestnut basally except on outer edges of outer webs; tertials like back; wing-coverts dull drab gray, with conspicuous tips of fuscous; sides of head and of neck pale drab gray, with edgings of fuscous; chin dull white; jugulum and breast pale grayish vinaceous, feathers with obscure fuscous tips which produce slight squamate effect; remainder of lower surface pale buff or buffy white, with conspicuous tips of fuscous, sides and flanks washed with ecru drab or pale grayish vinaceous; lining of wing chestnut, barred and tipped with fuscous black, and with conspicuous fuscous black area in middle of wing; axillars rather rufescent hair brown. Bill black or dull black, basal portion olivaceous; eye-ring greenish white or light green; iris pink, light rose, dull orange, orange-red, or bright red; legs and feet flesh color to bright pink or carmine. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Like nuptial adult male, but usually with fuscous bars on lower surface narrower and less distinct. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first winter:* Acquired by complete postjuvenile molt. Like adult male in winter. *Female, first winter:* Acquired by complete postjuvenile molt. Like adult female in winter. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adult female, but upper surface rather lighter; anterior lower parts also somewhat lighter, less vinaceous; wing-coverts and scapulars with subterminal bar of dull grayish buff. Bill pale plumbeous, terminal portion black; iris light pink, gray, or grayish brown. *Natal:* Unknown.

MEASUREMENTS: *Adult male:* Wing, 86.1–94.5 (average, 89.7) mm.; tail, 85.1–101.1 (91.7); bill (exposed culmen), 10.9–13.5 (12.2); tarsus, 15.0–16.5 (15.7); middle toe without claw, 14.0–16.0 (15.2). *Adult female:* Wing, 87.6–94.0 (90.7); tail, 87.9–102.1 (93.2); bill, 11.4–13.5 (12.2); tarsus, 15.0–16.5 (15.7); middle toe, 14.0–16.0 (15.2).

TEXAS: *Resident:* Collected north to McLennan, east to Trinity, south to Nueces and Cameron, west to Brewster and El Paso cos.

NESTING: *Nest:* In brushy pastures, but more often in immediate vicinity of dwellings, and other cultivated areas; on low tree, palm, bush, vines, top of utility pole, or exceptionally in basket hanging near house; rather compact platform of twigs, rootlets, weed stalks, grass, and leaves, occasionally horsehair, or strips of bark; usually unlined, but sometimes with grass stems, Spanishmoss, or a few feathers. *Eggs:* 2; elliptical oval; white, with slightly creamy tinge; average size, 22.4 × 16.8 mm.

WHITE-FRONTED DOVE, *Leptotila verreauxi* Bonaparte

SPECIES ACCOUNT

White-tipped Dove of various authors. A large, mostly terrestrial dove with rounded, white-tipped (all but central feathers) tail; uniformly dark brown wings with chestnut linings. Olive brown above with whitish forehead, iridescent nape and hindneck; whitish below, washed with purplish or purplish buff anteriorly and pale buff posteriorly. Length, 12 in.; wingspan, 18½; weight, 6 oz.

RANGE: S. Sonora and extreme s. Texas, south through Mexico (including Tres Mariás Islands), Cen-

tral America, and n. South America (including islands off coast of Venezuela) to n. Argentina and s. Brazil.

TEXAS: (See map.) *Resident*: Breeds, early Feb. to mid-Aug. (eggs, Feb. 13 to July 25) from near sea level to about 400 ft. Fairly common to uncommon in Rio Grande delta, upriver to Zapata-Webb county line (nesting unconfirmed). *Vagrant*: Brooks Co., Falfurrias area (late May, 1965, A. W. O'Neil); Kenedy Co., King Ranch, Norias Division (3 observations, Jan., 1969, B. A. Fall); Nueces Co., 15 mi. west of Corpus Christi (2 seen, Jan. 26, 1972, Ella Anderson, et al.). Three sightings in Big Bend Nat. Park: Dugout Wells and Chisos Basin (June 10, 12, 1956, Alexander Sprunt, Jr.); Rio Grande Village (June 30, 1970, R. H. Wauer).

HAUNTS AND HABITS: The White-fronted Dove, named for its whitish forehead, is the northernmost ranging of the *Leptotila*, a genus of large doves and small pigeons whose members inhabit thicket and jungle. In the semidry border country this species (which also inhabits moist dense woodlands) seeks the tallest trees and densest brush it can find. Probably the best present-day example of Whitefront habitat in the United States is that found just west of headquarters at Santa Ana National Wildlife Refuge. This prime haunt is a shady, brushy, Spanishmoss-hung grove of trees dominated by elms (*Ulmus*), tepeguaje (*Leucaena pulverulenta*), Texas ebony (*Pithecellobium flexicaule*), Mexican ash (*Fraxinus berlandieriana*), and anaqua (*Ehretia anacua*). On a primitive road which tunnels through this greenery, one or two of these rather solitary doves can usually be seen all times of the year as they stroll about on their carmine feet. At the slightest alarm, they scurry or fly into dense cover.

Flight is swift in spite of the bird's heavy body and ground-dwelling habit; however, it does not ordinarily fly above the treetops as do White-winged Doves and Red-billed Pigeons. The White-fronted Dove picks most of its food—seeds of hackberry, elm, ebony, anaqua, mesquite, pricklypear cactus, grasses; corn, sorghum, and a few crickets—off the ground or from low branches. Like other Columbidae, it requires water and drinks by the usual pigeon method.

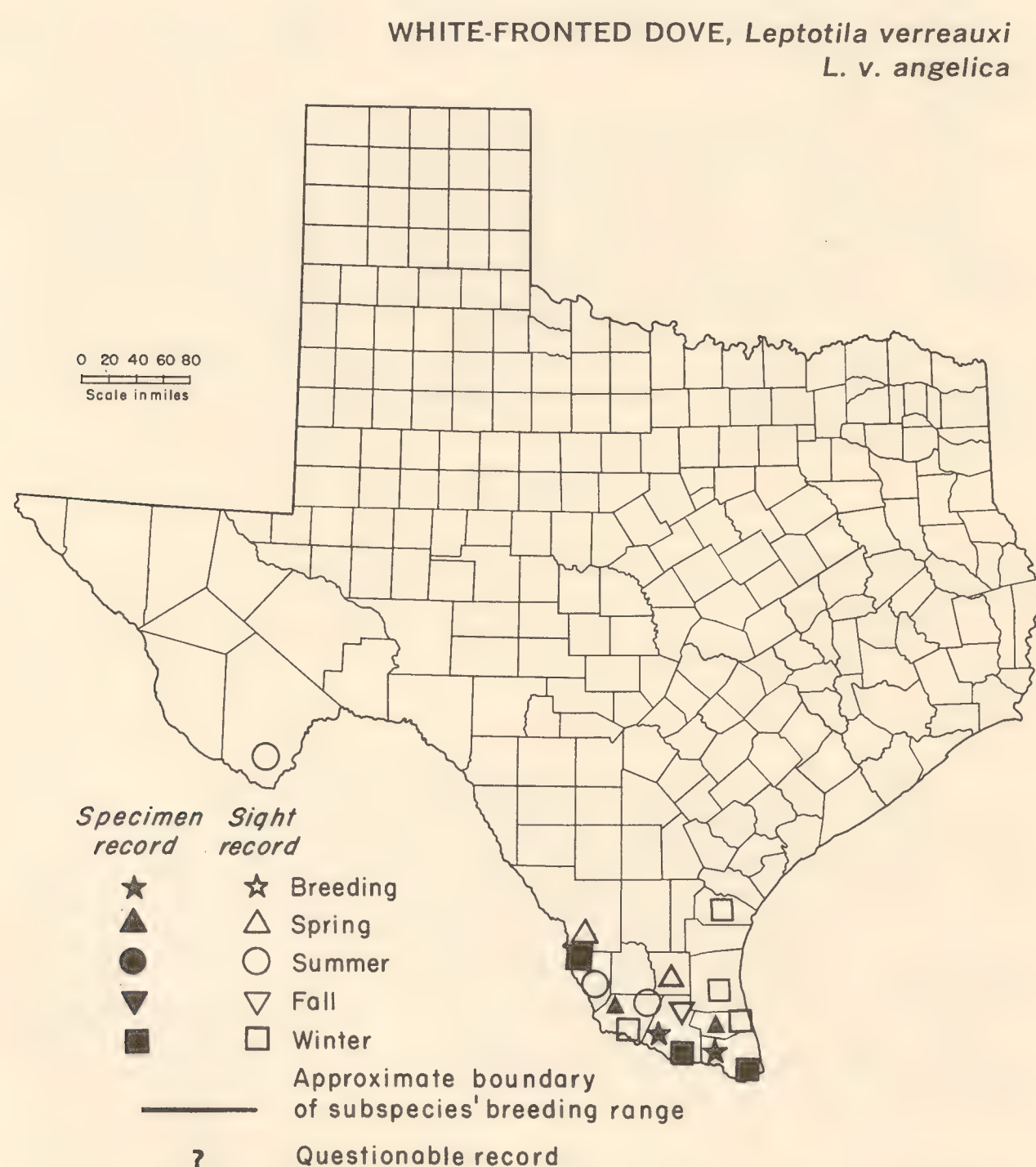
Voice of the White-fronted Dove, sometimes delivered from a higher perch than this bird usually frequents, is a low-pitched, ghostly *oo-whooooo*; at a distance this sounds like the *woooooo* produced by blowing gently across the mouth of a large empty bottle. Since this note appears to be the male's territory-courtship call, it is heard more frequently in spring and summer than at other seasons; at nearly all times it is uttered from a place of concealment.

CHANGES: Unlike the Red-billed Pigeon, the White-fronted Dove has survived fairly well to 1972 in small patches of timber and heavy brush. Exceptions occur in heavily poisoned stands; for example, in the excessively hydrocarboned (from agricultural dusts and sprays in surrounding cotton and other fields) ebonies along Olmito Resaca, Cameron County, the Whitefront population died out about 1960. In Texas, the present dove seems to have a fair chance to survive to the 1980's in the less cleared and poisoned portions of its range, especially in Starr and Willacy counties.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN WHITE-FRONTED DOVE, *Leptotila verreauxi angelica* Bangs and Penard

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Forehead light drab; occiput and hind-neck metallic lilac, with greenish and yellowish sheen posteriorly; remainder of upper parts olivaceous drab, including wing-coverts, scapulars, and tertials, and slightly more rufescent on wings and upper tail-coverts; middle tail feathers dull cinnamon brown; remainder fuscous black terminally, more tinged with brown basally, and with broad white or brownish white tips; wing-quills fuscous or light fuscous; sides of head and of neck dull light vinaceous fawn; chin almost white; jugulum and breast light grayish vinaceous or vinaceous buff; abdomen and crissum pale cinnamon buff; sides and flanks dull pale pinkish buff, verging to pale buffy wood brown; center of abdomen buffy white; lining of wing chestnut. Bill black; iris yellow or orange; bare skin around eye red and blue; feet carmine. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by partial prenuptial molt. Similar to adult male, but lower parts somewhat duller, particularly on jugulum and breast, which are also somewhat less vinaceous; middle of abdomen more extensively whitish. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding adult in winter. *Male and female, first nuptial*: Acquired by wear from first winter, with which it is practically identical. *Male and female, first winter*: Acquired by complete postjuvenile molt. Very similar to adult in winter. *Juvenal*: Acquired by complete postnatal molt. Upper parts dull olive brown, rather more rufescent posteriorly; back, rump, upper tail-coverts, scapulars, and wing-coverts margined with dull



cinnamon or russet; upper wing-coverts with shaft streaks of same; breast and jugulum dull drab or light hair brown, feathers tipped with dull buff or pale brown; remainder of lower parts dull brownish buff; center of abdomen paler or dull white. *Natal*: Unknown.

MEASUREMENTS: *Adult male*: Wing, 140.0–158.0 (average, 146.3) mm.; tail, 96.0–117.6 (106.7); bill (exposed culmen), 14.0–17.0 (15.7); tarsus, 27.4–33.0 (29.7); middle toe without claw, 22.1–25.4 (24.1). *Adult female*: Wing, 129.5–152.4 (142.7); tail, 94.5–114.6 (103.4); bill, 14.5–17.0 (16.3); tarsus, 26.9–31.0 (29.2); middle toe, 22.1–24.9 (23.9).

RANGE: S. Sonora and extreme s. Texas, south to Oaxaca and Veracruz.

TEXAS: *Resident*: Collected in Zapata, Starr, Hidalgo, Willacy, and Cameron cos.

NESTING: *Nest*: In forests, dense brush, thickets, and tangles of vines; in bush or even tree, sometimes on ground; rather large platform of twigs, weeds, grass, bark, and straw, with little or no lining. *Eggs*: 2; elliptical oval; rather glossy; cream buff, cartridge buff, olive buff, light drab, or light olive drab; unmarked; average size, 30.7 × 22.9 mm.

Parrots: Psittacidae

CAROLINA PARAKEET, *Conuropsis carolinensis* (Linnaeus)

SPECIES ACCOUNT

Also spelled Carolina Paroquet. A Mourning Dove-sized parakeet with a long (ca. 6 in.), pointed tail. *Adult*: mainly bright green with yellow head, becoming orange on forehead and near eye. *Immature*: entirely green, except for tawny orange forehead and loreal region passing into brown about eye. Length, 13 in.; wingspan, 21¾.

RANGE: *Extinct*. Last wild specimens (6) taken in Brevard Co., along Padget Creek, Florida (Apr. 18, 1901, E. A. Mearns). Last captive bird died in Cincinnati Zoo, Ohio (Sept., 1914). Formerly from North Dakota and vicinity of Great Lakes east to c. New York (occasionally) and New Jersey (2 sightings), south to Iowa, e. Colorado (casually), e. Texas, Gulf states, and Florida (all except extreme southern portion).

TEXAS: Last report was of one killed in Bowie Co., north of New Boston (ca. 1897, fide H. C. Oberholser). *Summer*: Probably bred in extreme northeast Texas; only report was from Red River Co. (resident, breeding in large numbers prior to 1886; E. C. Davis). Until ca. 1890 perhaps fairly common summer resident along Red River; reported from Bowie Co., north of New Boston (occurred regularly until ca. 1890, fide H. C. Oberholser); Lamar Co., Paris (many seen in woods, ca. 1888, and wounded bird confined in cage seen, Oct. 22, 1891, E. C. Davis); Fannin Co., north of Bonham (common resident, ca. 1888, H. F. Peters); Montague Co. (seen passing over between 1874 and 1877, Cris Meadows). Also reported in Brown Co., Brownwood (hundreds seen, summer 1885, E. C. Davis). *Winter*: Reported from Nueces Co., 5 mi. west of Corpus Christi (a number seen and 1 taken, ca. 1895, skin subsequently mounted, J. M. Priour); Lavaca Co. (several seen and 1 taken, fall 1863, Mrs. Mitchell, mother of J. D. Mitchell); Colorado Co., Colorado River (reported in mid-1800's by a Mr. Chadoin, known to J. D. Mitchell); Jasper and Jefferson cos. (flocks of 20 to 30 often seen in fall, prior to 1870, M. Wiess).

HAUNTS AND HABITS: Of the 315 species (Van Tyne and Berger) of macaws, parakeets, and parrots comprising the flamboyant Psittacidae family, only one—the Carolina Parakeet—was a true native of the United

States; it, in fact, constituted a genus endemic to this country. Despite many rumors through the years of wild Mexican parrots along the Rio Grande, *Conuropsis* remains the only psittacid known with certainty to have occurred naturally within Texas during historic time. This very gregarious bird once ranged hardwood and mixed forests of the eastern United States and westward along timbered rivers to the Great Plains. Prime haunts were river and streambottom woods, baldcypress swamps, and the vicinity of saline licks (saltwater springs). Apparently the bird rarely came to the ground except to drink salt water (recorded) and fresh water (seemingly unmentioned in eyewitness accounts).

Oberholser was able to track down only one direct remembrance of the Carolina Parakeet's haunts and habits in Texas. One M. Wiess, an old resident of Beaumont (Jefferson Co.), told him that in this locality for some time previous to 1870 parakeets were often noticed in early fall wandering about in flocks of twenty to thirty or more; after lingering a short time, they would move south. Wiess observed them in Jasper and Jefferson counties and said they stayed most of the time in the tops of tall trees.

Some of the most noted American ornithologists of the nineteenth century—Alexander Wilson, J. J. Audubon, C. J. Maynard, William Brewster, C. E. Bendire, and Robert Ridgway—watched Carolina Parakeets both in the wild (chiefly along the Mississippi and in Florida) and in captivity. Strangely, none of them personally witnessed the bird's nesting habits. Instead, they relied on the stories of alligator and egret-plume hunters. The consensus among naturalists was that *Conuropsis carolinensis* nested in cavities in tree trunks, as do most parakeets, rather than building a Mourning Dove-like nest of twigs in branches, as reported by Brewster.

Flight was swift and direct, and the bird was very skillful at dodging branches. Like its contemporary, the Passenger Pigeon, it traveled in dense nomadic flocks. However, the parakeet was less numerous than the pigeon; in the eighteenth century, individuals in a flock numbered hundreds, instead of millions. A flock of Carolina Parakeets awoke early in the morning and flew out as a body in a screeching search for food. Perched in trees, the Carolina exhibited the usual parrot dexterity as it used its bill and feet (two toes for-

ward, two back) to climb about the branches. Individuals were apparently either left or right "handed"—not ambidextrous—when putting food into the mouth with their toes. When resting in the heat of the day amid green leaves of a tree, the birds were quiet and well camouflaged. In mid- or late afternoon the flock went foraging again. As evening shadows gathered, the parakeets flew to a large, hollow baldcypress or American sycamore in a waterside area. Clusters of birds roosted inside the cavelike hollow trunk. Each bird hooked its upper mandible into the wood; occasionally an individual hung entirely by its bill, but usually it used its feet and tail as props.

The Carolina Parakeet's diet was varied. It ate seeds or fruits of thistle (*Cirsium*), cocklebur (*Xanthium*), sand-bur (*Cenchrus*), pine (*Pinus*), baldcypress (*Taxodium*), maple (*Acer*), elm (*Ulmus*), pecan (*Carya illinoensis*), beech (*Fagus grandifolia*), oak (*Quercus*), pawpaw (*Asimina triloba*), haw (*Crataegus*), mulberry (*Morus*), and hackberry (*Celtis*). As land opened to agriculture, *C. carolinensis* devoured corn, other grains, and cultivated fruits—especially apples, pears, peaches, and oranges. Seemingly, only one stomach of the species was examined in a scientific manner. It contained remains of thirty-two seeds of loblolly pine (*Pinus taeda*), two ant fragments, two rabbit hairs, and two bits of the bird's own feathers (see Cottam and Knappen, 1939, *Auk* 56: 158). It is curious that the forest-dwelling parakeet shared, to some extent, the feather-eating behavior of the very aquatic grebes.

Flight call of the Carolina Parakeet was a rapid, loud, screeching *qui-qui, qui, qui, qui, qui-i-i-i*, with a rising inflection on each *i*. Perched, birds uttered a low chatter. The foregoing description is standard for parakeet vocalizations the world over. However, according to M. H. Swenk, *Conuropsis* had another call which "resembled the shrill cry of a goose and was frequently uttered for minutes at a time." How unfortunate that tape recorders were not invented until after the Carolina Parakeet had flown to the happy hunting ground.

CHANGES: First published record of the Carolina Parakeet's occurrence in Texas appears to be in D. B. Edward's *History of Texas*, which mentions the species' presence in 1836. S. W. Woodhouse (1853, *Report of an Expedition to the Zuni and Colorado Rivers*, p. 89) reported the parakeet to be numerous along large streams of eastern Texas in 1849 or 1850. Apparently, at least in the nineteenth century, the bird was resident and bred in the state only in the heavily wooded Red River Valley near the Oklahoma and Arkansas borders. Postnuptial, winter, or other wandering flocks occasionally reached west to the central Edwards Plateau, southeast to Beaumont, and southwest to Corpus Christi. H. C. Oberholser established extirpation of *Conuropsis carolinensis* in Texas with the killing of a bird in Bowie County in about 1897.

The demise of the Carolina Parakeet in Texas was probably a result of the species' general collapse, and not because of any extraordinary harassment by Texans. Outside the state, persecution was very heavy.

The bird was regarded as a great despoiler of crops of corn, apples, pears, peaches, and oranges. Outraged farmers shot all the parakeets in their fields or orchards—a fairly easy task since members of a flock habitually hovered over a felled companion until all were gunned down. As late as 1889, John M. McCrary (Sept. 24, 1891, "The Carolina Paroquet in Florida," *Forest and Stream* 37: 183) reported two hundred birds killed by one man in one orange grove in Hernando County, Florida. The parakeets were also shot for their plumage, and young birds were taken in hundreds for the pet trade. During the parakeet's last years, its prime baldcypress swamps were worked over by timber cutters. With the end in sight, collectors stepped up efforts to secure specimens while the getting was still possible.

The last unquestioned sight record was established by ornithologist Frank M. Chapman who saw two flocks—totaling thirteen individuals—along Taylor's Creek, northeast side of Lake Okeechobee, Florida, April, 1904. No one will ever know when the last wild Carolina Parakeet expired.

The small, green and yellow ghost was apparently fluttering feebly until 1938 in South Carolina's Santee Swamp—now largely destroyed by a hydroelectric project. In Florida in the early 1950's, Alexander Sprunt, Jr., knew an ancient backwoods naturalist who swore that the Carolina Parakeet yet lived in the Sunshine State, just where he never told. All late rumors that have been thoroughly investigated have turned out to be based on wishful thinking or escaped foreign parakeets—especially the Mexican *Aratinga holochlora*, which all its life resembles a young *Conuropsis carolinensis*.

As far as firm evidence goes, the last Carolina Parakeet died in Cincinnati Zoological Garden, Ohio, in September, 1914. The last Passenger Pigeon died in this same zoo in the same month of the same year. Thus, at one point in time and space two American tragedies were consummated.

DETAILED ACCOUNT: ONE SUBSPECIES

WESTERN CAROLINA PARAKEET, *Conuropsis carolinensis ludovicianus* (Gmelin)

Also known as Interior Carolina Parakeet and Louisiana Parakeet.

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Forehead, anterior part of crown, lores, and orbital region ornamented orange; rest of head, neck, chin, and throat lemon yellow; lower hindneck, rump, and lesser wing-coverts vanderpoel green, cendre green, or turquoise green; middle of back similar but somewhat more yellowish, with narrow fuscous shaft stripes; tail feathers similar; upper tail-coverts similar and somewhat lighter; primaries fuscous, outer webs bluish green terminally and edged basally with citrine yellow; primary coverts fuscous, outer webs bluish green; secondaries, except innermost, fuscous, outer webs terre verte or french green, innermost secondaries with outer webs much more yellowish; greater coverts similar to tertials; edge of wing lemon yellow, slightly mixed with orange; rest of lining of wing, jugulum, and remainder of lower surface apple green with decidedly bluish wash; anal region and lower part of thighs lemon yellow, sometimes with more or less orange. Bill cream buff, cream color, or creamy white; bare space around eyes light flesh

color or pinkish white; iris blackish brown; legs and feet pale flesh color or pinkish white; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adults. *First nuptial*: Acquired probably by wear from first winter. Apparently identical, or nearly so, with nuptial adults. *First winter*: Acquired by complete postjuvinal molt. Apparently identical, or nearly so, with adults in winter. *Juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but orange of forehead more restricted, feathers about eye dull brown; yellow of head and neck replaced by green; upper parts darker and duller; yellow of edge of wing, thighs, and anal region replaced by green. *Natal*: Gray.

MEASUREMENTS: *Adult male*: Wing, 183.9–203.5 (average, 192.3) mm.; tail, 138.4–167.1 (156.4); bill (culmen from cere), 23.9–25.9 (25.1); tarsus, 15.5–18.0 (16.8); middle (outer anterior) toe without claw, 21.1–23.1 (22.4). *Adult female*: Wing, 183.1–194.6 (185.9); tail, 136.4–156.9 (149.6); bill, 23.6–24.9 (24.1); tarsus, 15.5–18.0 (16.3); middle (outer anterior) toe, 21.1–22.6 (21.9).

RANGE: *Extinct*. Formerly c. North Dakota and Ohio to w. New York, south to e. Texas, s. Louisiana, and Mississippi; casual in fall and winter to s. Texas.

TEXAS: *Summer*: No certainly preserved specimen (see species account). *Winter*: Two taken, one of these mounted and preserved for a time (see species account).

NESTING: *Nest*: Unknown, but probably similar to that of *C. c. carolinensis*, which reportedly nested in hollows in trees in woodlands, also possibly in nests of twigs on tree branches. *Eggs* (laid by captives): 2–5; usually 2–3; ovate to short ovate; ivory white, glossy, and conspicuously pitted; unmarked; average size, 34.8 × 26.9 mm.

[GREEN PARAKEET, *Aratinga holochlora* (Sclater)]

Also spelled Green Paroquet. Green Conure of cage bird fanciers. An all-green-feathered parakeet with long (5 in.), pointed tail; under parts paler and more yellowish than bright green dorsal surface. Length, 9½–10 in.

RANGE: Tropical n.w. Mexico (Sonora, Sinaloa, and Chihuahua); e. Mexico from Nuevo León and Tamaulipas, south at moderate elevations to Caribbean slope of n. Guatemala. Other forms sometimes considered conspecific with *A. holochlora* range along Pacific from s.w. Mexico to Nicaragua and from e. Guatemala to n. Nicaragua.

TEXAS: *Hypothetical*: Possibly an accidental visitor to Rio Grande delta. Reported from Hidalgo Co., Santa Ana Nat. Wildlife Refuge (1 carefully identified, Oct. 10, 11, 1960, R. J. Fleetwood). After this observation the Green Parakeet was added as a postscript to official Santa Ana bird check-list.

Of all the Psittacidae, *Aratinga holochlora* would seem to be the one most likely to stray to south Texas as a wild bird. The species is a permanent resident in fair numbers along the Río Corona, Tamaulipas, 180 car miles southwest of Brownsville; occasional small flocks appear in the vicinity of Santander Jiménez, only 143 miles from Texas' southmost city. Vegetation surrounding the two Mexican localities and Santa Ana Refuge is rather similar, although Montezuma baldcypress (*Taxodium mucronatum*), which seems especially important to the Green Parakeet, is most numerous along the Río Corona. However, the official

U.S. national champion Montezuma baldcypress is situated on the banks of the Rio Grande, as is Santa Ana; both are located in the same small county of Hidalgo.

The case for natural occurrence in the United States of *Aratinga holochlora* is by no means proved. The fact that the Santa Ana individual was alone would point to an escapee origin, since this parakeet is very gregarious at all times of the year. Among Americans the Green Parakeet is unpopular as a cage bird because it is reputed to be a nontalker and its overall green color is regarded as monotonous. With Mexicans just across the Río Bravo (Rio Grande) from Santa Ana the situation is somewhat different. Why waste money on expensive imported Australian or African parakeets when *Periquita Verde* can be had close at hand for little or nothing?]

[YELLOW-HEADED PARROT, *Amazona ochrocephala* (Gmelin)]

Northern birds usually called Mexican Double Yellow Head by cage bird fanciers. Mostly bright green; yellowish band at end of square-tipped tail; color of head variable according to subspecies—may be all yellow (northernmost-ranging race, *oratrix*) or mostly green with yellow crown-patch and yellow hindneck; blue-edged black primaries; red patch on secondaries; red markings at base of tail; stout, sharply hooked buffy white (*oratrix*) or dusky (*auro-palliata*) beak. Length, 13–15 in.

RANGE: Tropical Mexico (in northeast to Nuevo León and Tamaulipas), south to Ecuador, Peru, Brazil, and Trinidad.

TEXAS: *Hypothetical*: Possibly casual visitor, at least formerly, to Rio Grande delta. Reported from Hidalgo Co., Santa Ana Nat. Wildlife Refuge (1 seen, Nov. 6, 1960, R. J. Fleetwood; Mar. 25, 1972, W. A. Shifflett; Apr. 15, 1972, J. C. Arvin); and Cameron Co., Brownsville (4 seen, Dec. 3, 1961, Mr. and Mrs. J. B. Strickling; 2 seen, July 8, 1962—and almost every day for the year previous, H. E. Melton).

There can be no doubt that parrots have been seen in extreme southern Texas. The above sightings are only some of the most recent. Typical of the early-day rumors of parrot flocks along the lower Rio Grande is one by Melton. He told Oberholser that he had heard reports of flocks numbering up to 500 birds in times past (presumably about 1900 or earlier). Unfortunately these old-time parrots were not identified to species, and no specimens or photographs were taken.

All recent (later than 1920) parrots in Texas can probably be safely written off as escaped cage birds. In the 1960's and early 1970's, some escapees around Brownsville were tame enough to be enticed out of shade trees by tortillas tied on the ends of sticks (fide Larry Lof). During the twentieth century, many hundreds of the Yellow-headed Parrot (reputed to be the

most skillful-talking avian native to the Western Hemisphere) have been imported through Brownsville.

It is noteworthy that observations of free-flying singles and groups (some up to 15 individuals) have been of this favorite cage species and not of the Red-crowned Parrot, *Amazona viridigenalis*, which since

World War II has been more numerous close to Texas (in Tamaulipas) than the Yellowhead. The Redcrown, usually called Green-cheeked Amazon in the cage bird trade, has the reputation of being an overly noisy squawker and a poor imitator of human speech. It is, therefore, imported comparatively little, thus reducing chances of escapees flying over the U.S. landscape.]

Cuckoos: Cuculidae

[MANGROVE CUCKOO, *Coccyzus minor* (Gmelin)]

Also known as Black-eared Cuckoo. Resembles Yellowbill, but has black stripe through eye (broadest on ear-coverts); rich buff posterior under parts, the throat and breast varying from buff to whitish; grayer crown; lacks rufous in wing. Length, 12 in.

RANGE: Coastal s. Florida and West Indies; also Tres Mariás Islands, c. Sinaloa, and Tamaulipas, south, often in mangrove belts, through lowlands of Middle America (including many offshore islands) to n. coast of South America (including most islands off Venezuela).

TEXAS: *Hypothetical:* One careful sighting: Galveston Co., Galveston, Menard House at 33rd and N. ½ streets (1 on Audubon Christmas Bird Count, Dec. 30, 1964, Mr. and Mrs. J. O. Ellis, Mrs. Stewart LeBlanc).]

YELLOW-BILLED CUCKOO, *Coccyzus americanus* (Linnaeus)

SPECIES ACCOUNT

A slim, long-tailed bird. Brown above and white below with conspicuous rufous wing-patch; large white spots on underside of black tail; upper mandible largely black, lower mandible yellow. Length, 12 in.; wing-span, 16¾; weight, 2¼ oz.

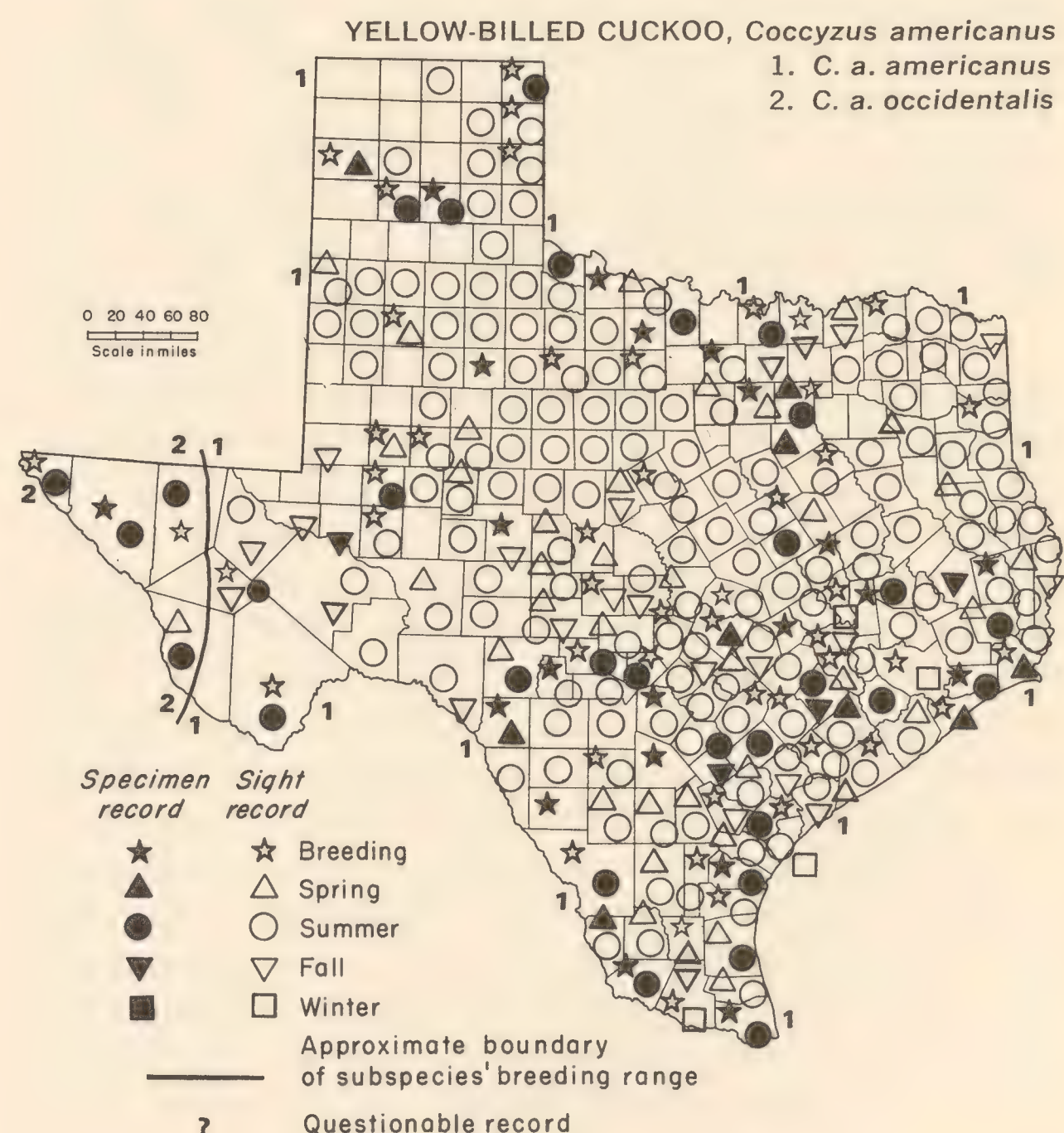
RANGE: S. British Columbia, Dakotas, Great Lakes region, and New Brunswick, south to Baja California and n. mainland Mexico (possibly to Yucatán), Gulf states, and s. Florida; also West Indies. Winters chiefly in South America.

TEXAS: (See map.) *Breeding:* Mid-Mar. to mid-Sept. (eggs, Mar. 22 to Sept. 5) from near sea level to 7,500 ft. Common to uncommon in all parts. *Migration:* Apr. to late May throughout, except May to mid-June in Trans-Pecos; mid-Aug. to early or mid-Oct. (extremes: Mar. 17, early July; Aug. 15, Nov. 21). Very common to fairly common throughout. *Winter:* No specimen, but several sightings from Dec. 27 to Feb. 13 along coast and in Hidalgo Co.

HAUNTS AND HABITS: Many of the world's 128 cuckoos are bizarre in appearance or in nesting habits or both; in addition, various species seem to mimic either closely or vaguely the appearance of birds in other families. Best known and most widespread members of the

Cuculidae in Texas are the Roadrunner and the Yellow-billed Cuckoo. Here, as elsewhere in its breeding range, the Yellowbill summers in dense foliage of open woodlands, especially fringes along streams and rural roads. Notwithstanding its retiring habits, it also lives readily in shade trees, orchards (seldom-sprayed ones), and gardens of ranch and farm, town and city. Unlike most Old World cuckoos, the Yellowbill is usually not a nest parasite. However, there are occasional records of this species laying eggs in nests not its own; birds imposed upon generally produce eggs similar in size and color to those of this cuckoo. The species is seen almost always singly or in pairs.

On the wing, the Yellowbill is graceful, swift, and direct as it slips quietly through its shadowy haunts. In the air it suggests a slender, silent-winged Mourning Dove. Seldom is the cuckoo seen on an exposed vantage. A sluggish bird, it prefers instead to skulk in leaves where it perches motionless in characteristic cuckoo fashion—two toes forward, two back—while eyeing leafy twigs for insects. By far its favored food is caterpillars, even hairy species whose spines often



coat the inside of the bird's stomach; it also eats locusts, beetles, bugs, grasshoppers, ants, wasps, other insects, an occasional frog or lizard, and in summer and autumn, a few wild fruits—raspberry, elderberry, mulberry, etc.

The Yellowbill's presence is often first revealed by its clucking, hollow, wooden notes: *ka ka ka ka ka ka ka ka ka ka ka kow kow kowlp kowlp kowlp kowlp*; this throaty series is rapid at first, but as it runs down the scale becomes noticeably slower. Calling is most frequent on cloudy days (hence the colloquial name raincrow) from late April into July. In August and September most individuals fly silently back to South America.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN YELLOW-BILLED CUCKOO, *Coccyzus americanus americanus* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Upper parts, including wings and middle tail feathers, dull hair brown with gloss of metallic gray or olive; remainder of tail fuscous black, with broad white tips on three outer pairs of feathers; bases of primaries and secondaries, except innermost, dull cinnamon rufous; sides of head and neck like upper parts but, together with forehead, slightly more grayish, ear-coverts rather darker; entire lower surface white, slightly shaded with gray anteriorly and on flanks; lower tail-coverts slightly tinged with buff; lining of wing pale pinkish buff or buffy white. Maxilla and tip of mandible black or slate black, but basal portion of cutting edge of maxilla and mandible chrome yellow; bare eyelids gallstone yellow; bare skin around eye gray; iris vandyke brown; legs and feet slate color or plumbeous; claws brownish black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by complete prenuptial molt. Like nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but wings and tail retained from juvenile. *Juvenal:* Acquired by postnatal growth. Similar to nuptial adults, but bill smaller; outer webs of primaries more extensively rufescent, as are also primary coverts; dark area of tail duller and more brownish, usually fuscous, white tips of rectrices somewhat duller and less sharply contrasted. Naked skin of orbital region pale yellow; yellow area of bill almost as extensive as in nuptial adults, but duller, more tinged with brown, and not extending to cutting edges of maxilla. Similar to juvenile Black-billed Cuckoo, *Coccyzus erythrophthalmus*, but yellow of side of mandible darker and more extensive, and very plainly visible from a lateral viewpoint. *Natal:* None. Bird hatched unfeathered, except for a few hairlike feather sheaths; skin black.

MEASUREMENTS: *Adult male:* Wing, 135.1–153.9 (average, 143.8) mm.; tail, 133.6–150.1 (140.7); bill (exposed culmen), 23.9–28.9 (26.2); tarsus, 23.1–26.9 (25.1); middle (outer anterior) toe without claw, 17.0–20.1 (18.3). *Adult female:* Wing, 138.4–151.1 (146.3); tail, 138.9–151.1 (145.8); bill, 24.9–29.4 (26.9); tarsus, 23.9–26.9 (25.1); middle (outer anterior) toe, 17.5–19.6 (18.5).

RANGE: North Dakota to New Brunswick, south to Nuevo León, Tamaulipas (possibly to c. Veracruz and Yucatán), Gulf coast, and s. Florida; also Bahamas (probably), Greater Antilles, and extreme n. Lesser Antilles (likely). Winters mainly in w. South America to c. Argentina.

TEXAS: *Breeding:* Altitudinal range, near sea level to about 5,500 ft. Collected north to Lipscomb, east to Cooke and Jefferson, south to Cameron, west to Brewster, Jeff Davis, and Oldham cos. Common. *Migration:* Two specimens outside breeding range: Culberson Co., Guadalupe Mts., Bee Creek, 7 mi. north

of Pine Springs (Aug. 15, 1940, D. Quimby; Aug. 18, 1940, N. H. McRoberts). Common.

NESTING: *Nest:* In woodlands, thickets, briar patches, orchards (unsprayed ones), and other cultivated lands, along streams; in tree, bush, or vine; shallow, slightly cupped platform, usually loosely constructed, of twigs, roots, and strips of bark, with slight lining of straw, pine needles, grapevine bark, or similar materials. *Eggs:* 2–8, usually 3–4; oval to elliptical oval; pea green, glaucous green, Nile blue, or pale greenish blue, sometimes washed with white; unmarked; average size, 30.2 × 22.9 mm.

CALIFORNIA YELLOW-BILLED CUCKOO, *Coccyzus americanus occidentalis* Ridgway

DESCRIPTION: *Adults, nuptial plumage:* Similar to *C. a. americanus* but decidedly larger, particularly bill and wing.

MEASUREMENTS: *Adult male:* Wing, 143.5–154.4 (average, 149.9) mm.; tail, 140.0–154.9 (147.3); bill (exposed culmen), 26.9–29.9 (28.7); tarsus, 24.9–28.9 (26.7); middle (outer anterior) toe without claw, 18.5–20.1 (19.3). *Adult female:* Wing, 144.0–156.4 (150.4); tail, 133.1–155.9 (147.3); bill, 25.9–28.9 (28.2); tarsus, 24.9–28.4 (26.7); middle (outer anterior) toe, 18.0–20.1 (19.3).

RANGE: S. British Columbia to c. Colorado, south to s. Baja California, Sinaloa, and w. Trans-Pecos Texas. Winters probably in South America.

TEXAS: *Breeding:* Altitudinal range, 3,000 to 7,500 ft. Collected in El Paso, Hudspeth, Culberson, and Presidio cos. Fairly common.

NESTING: *Nest:* Similar to that of *C. a. americanus*. *Eggs:* 1–4, probably also up to 8, usually 3–4; elliptical oval to elliptical ovate; light greenish blue, unspotted; average size, 30.7 × 23.1 mm.

BLACK-BILLED CUCKOO, *Coccyzus erythrophthalmus* (Wilson)

SPECIES ACCOUNT

Closely resembles Yellowbill, but bill appears entirely black (rarely with a hint of yellow at base); narrow eye-ring of bare skin is red; wing lacks bright rufous patch; smaller, duller white tail-spots on underside of essentially olive brown tail. Length, 11¾ in.; wingspan, 15¾; weight, 1¼ oz.

RANGE: S. Saskatchewan to Nova Scotia, south to s.e. Wyoming, n. Oklahoma, n. Texas (casually), n.w. Arkansas, n. Alabama (rarely), and South Carolina. Winters in n.w. South America (including Trinidad); casually north to n.e. Mexico.

TEXAS: (See map.) *Breeding:* Three, possibly four, records, all from north central Texas: Wise Co., near Decatur (nest and 3 eggs collected, May 2, 1888, nest and 4 eggs taken, May 4, 1888, R. L. More; certification based on identification of adult on nest); Decatur (nest and 3 eggs collected, May 21, 1888, J. A. Donald); southwestern Dallas Co. (immature seen, July 1940, C. T. Gill). *Migration:* Late Apr. to late May; late Aug. to mid-Oct. (extremes: Apr. 13, June 14; July 17, Nov. 6). Fairly common (some years along coast) to scarce in spring through eastern two-thirds. Uncommon to rare in fall through eastern two-thirds; rare west to Amarillo, Parmer Co., and Midland.

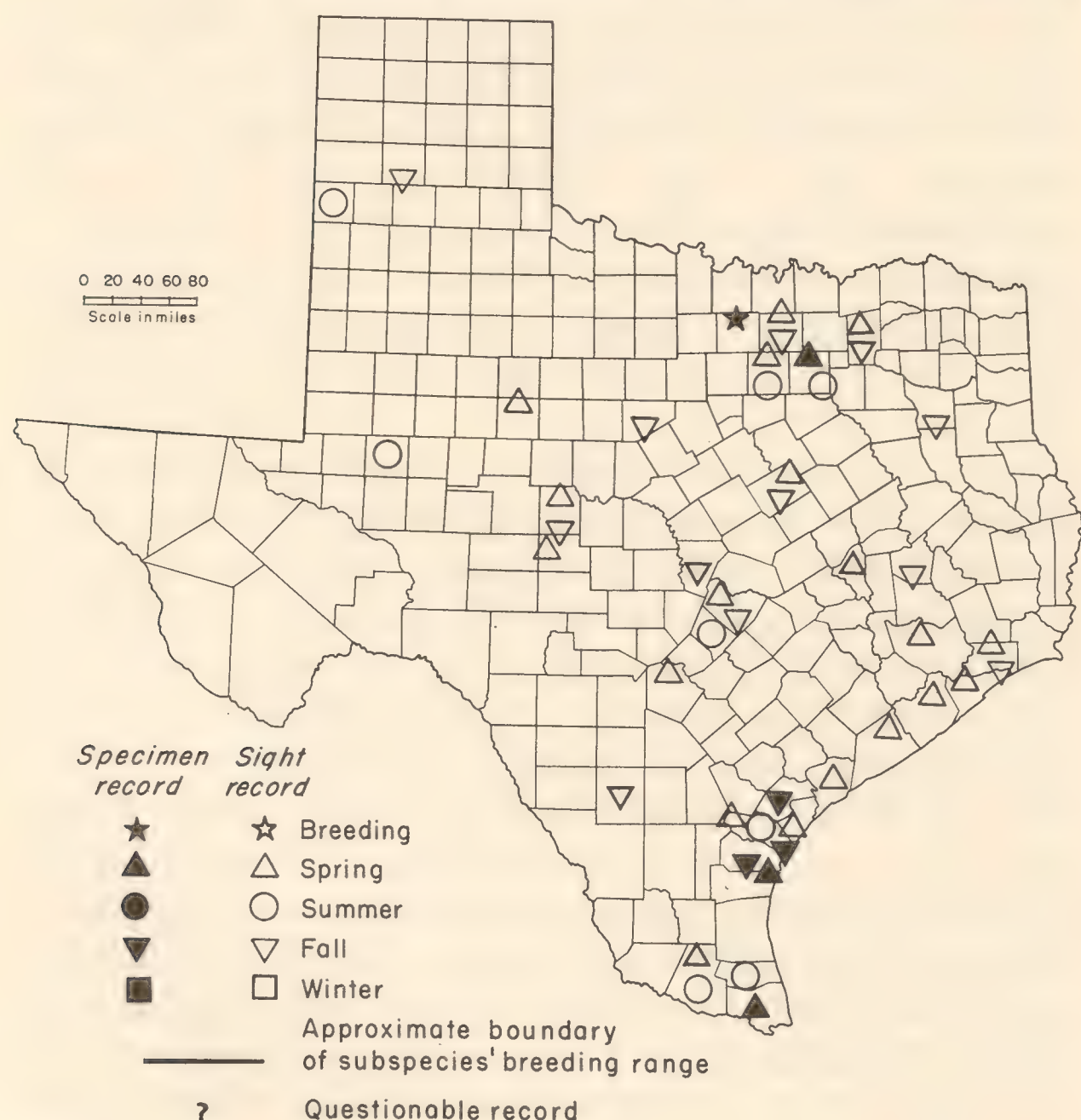
HAUNTS AND HABITS: The Black-billed Cuckoo is per-

haps even a greater recluse than its close relative, the Yellowbill. On its more restricted breeding range in southern Canada and northern United States (the Yellowbill nests south into Mexico), the present species seeks dense woodlands. Where both cuckoos are common breeders, they occasionally lay eggs in each other's nests; infrequently Blackbills also parasitize nests of smaller woodland birds—Eastern Wood Pewee, Yellow Warbler, Cardinal, Chipping Sparrow, others. In the eastern portion of Texas, the elusive Blackbill is known chiefly as a migrant. It passes quietly through woodlands, particularly along streams, ponds, and lakes, dense borders of meadows and margins of forests, also groves and deep thickets of coastal prairies. It comes freely into orchards and gardens of human habitations, but even here remains well hidden from would-be observers.

The graceful flight and shy, retiring habits of this cuckoo are practically indistinguishable from Yellowbill behavior. It is fully as voracious a caterpillar hunter as its relative but, like it, also eats a variety of grasshoppers, crickets, beetles, other insects, spiders, and occasionally wild fruits. In mid-summer, the species is sometimes active at night when its *cucucuing* is heard in nocturnal flights high in the sky or while perched in trees.

The voice of the Black-billed Cuckoo is less guttural and more liquid and cooing than the *kow's* and *kowlp's* of the Yellowbill. Its common call, uttered in groups of two, three, or four notes, is a rhythmic *cu cu cu*, *cucucu*, *cucucu*, *cucucucu*, *cucucu*, etc.; sometimes heard are soft *kuk's* which do not slow toward the end of the series as do the Yellowbill's *kowlp's*. Blackbills are not heard much in Texas.

BLACK-BILLED CUCKOO, *Coccyzus erythrophthalmus*



DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by complete prenuptial molt. Upper parts, including wings and tail, hair brown with gloss of dull bronzy olive, tail and upper tail-coverts slightly more greenish, forehead somewhat grayish; tail feathers, except middle pair, with subterminal bar of fuscous and tip of grayish white; wing like upper surface, but basal portion of primaries and secondaries on inner webs pale dull cinnamon buff; lower parts dull white, slightly buffy or grayish on anterior portions and on crissum; lining of wing pale pinkish buff, sometimes shaded with gray. Bill black or slate black, but mandible plumbeous or cinereous on basal portion, sometimes slightly tinged or mottled with dull white or pale yellow on base of gonys; bare eyelids and bare skin about eye vermilion, orange rufous, olive buff, or light yellow; iris raw umber or prout brown; feet plumbeous, dark plumbeous, or cinereous; claws slate black or slate color. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults, but throat strongly tinged with buff. Mandible with half or two-thirds of lower parts (gonys) dull pale yellow, extending also up over its side, but not to cutting edge, and visible laterally as yellow spot on side of middle portion. *First winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but outer webs of primaries and most wing-coverts much more rufescent; light tips of rectrices narrower, duller, and more buffy; anterior lower parts dull grayish buff. Naked skin around eye yellow. *Juvenal:* Acquired by postnatal growth. Similar to nuptial adults, but upper parts darker and duller; feathers, chiefly of hindneck, scapulars, wing-coverts, and posterior upper parts, tipped with dull grayish white; basal part of primaries, particularly on outer webs, and lesser wing-coverts dull russet; throat and jugulum washed with dull buff; light tips of rectrices narrower, duller, and more buffy. Maxilla blackish slate; mandible mostly cinnamon, but with middle two-thirds of gonys dull pale yellow or dull white, extending also somewhat over side of mandible but not to cutting edge; eye-ring gallstone yellow; legs and feet cinnamon; claws slate black. *Natal:* None. Bird hatched unfeathered, except for a few hair-like feather sheaths; skin deep black.

MEASUREMENTS: *Adult male:* Wing, 128.0–144.0 (average, 137.2) mm.; tail, 142.0–161.0 (149.9); bill (exposed culmen), 22.6–25.9 (23.9); tarsus, 21.1–24.9 (23.6); middle (outer anterior) toe without claw, 16.0–19.0 (17.5). *Adult female:* Wing, 136.7–146.6 (141.2); tail, 146.6–164.6 (154.7); bill, 21.6–24.9 (23.4); tarsus, 21.6–25.4 (23.9); middle (outer anterior) toe, 16.5–19.0 (17.8).

TEXAS: *Breeding:* Nests and eggs collected in Wise Co. (see species account). Nest taken by R. L. More on May 4 was a mere platform of sticks placed on limb of streamside boxelder (*Acer negundo*) about 10 ft. above ground; nest obtained on May 2 was of similar loose construction and in similar situation, but about 8 ft. above ground. *Migration:* Collected in Dallas, Refugio, San Patricio, Nueces, and Cameron cos.

NESTING: *Nest:* In margins of woodlands, swamps, thickets, and unsprayed orchards; rather loosely constructed platform of sticks, catkins, bark strips, rootlets, and weed stalks; lined with dry leaves, catkins, and flowers of plants. *Eggs:* 2–8 (possibly larger number product of two females), usually 3–4; oval to elliptical oval; Nile blue, pale beryl green to verditer blue; unmarked; average size, 27.2 × 20.6 mm.

ROADRUNNER, *Geococcyx californianus* (Lesson)

SPECIES ACCOUNT

Also known as Greater Roadrunner; chaparral and paisano are widespread folk names. A large, shaggy-crested, long-necked, terrestrial cuckoo that runs rapidly. Has heavy, powerful, blackish bill; short,

rounded wings (each with white crescent noticeable in flight); very long, iridescent, white-tipped tail; long, strong, pale blue (usually) legs; and tough feet (2 toes forward, 2 back). Liberally whitish-streaked metallic blue-black, green, and bronzy brown above; dull white below, throat and breast streaked with blackish; streak of bare skin behind eyes blue anteriorly, orange or red posteriorly. Length, $22\frac{1}{4}$ in.; wingspan, $21\frac{3}{4}$; weight, $10\frac{1}{2}$ oz.

RANGE: N. California to s. Kansas, w. Arkansas, n.w. Louisiana, and Texas, south to s. Baja California and c. mainland Mexico.

TEXAS: (See map.) *Resident:* Breeds, early Mar. to late Oct. (eggs, Mar. 5 to Oct. 10) from near sea level to 6,800 ft. Common to uncommon virtually throughout but scarce along southeastern boundary.

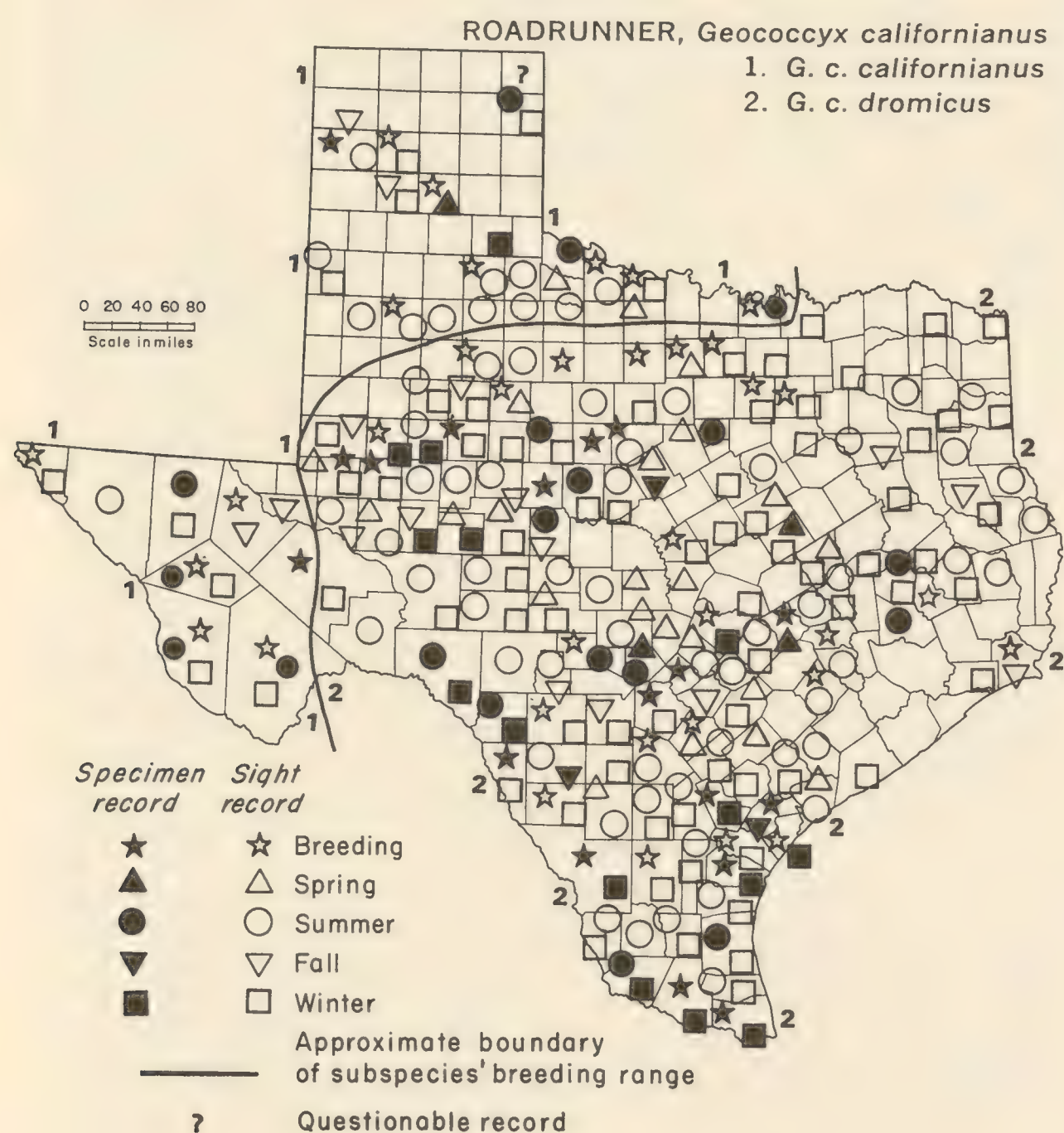
HAUNTS AND HABITS: The Roadrunner, a mighty cuckoo which runs on the ground, is nowadays (early 1970's) enormously and increasingly popular. Artisans and factories in Europe (especially Switzerland), Asia, (Hong Kong and Japan chiefly), and almost everywhere in North America grind out an endless stream of pins, brooches, earrings, bracelets, handkerchiefs, cuff links, tie clasps, neckties, figurines, statuettes, and just plain pictures, signs, plates, trays, place mats, napkins, stickers, and decals showing Roadrunners in every conceivable and inconceivable pose and degree of abstraction. Incredibly prevalent are these images in and near New Mexico where the chaparral is the state bird. In earlier years of the twentieth century, a Roadrunner silhouette based on a drawing by the celebrated American bird artist, Louis Agassiz Fuertes, became the emblem of both the Texas Folklore Society and J. Frank Dobie, leading Texas man of letters. To nineteenth-century Mexicans of the land, especially *pas-*

tores (shepherds), this glorified cuckoo was *paisano* (fellow countryman and friend). Many stories did these folk tell, often by a flickering mesquite campfire, of how this bird pecked out the brains of huge rattlesnakes or imprisoned them within a corral of cactus joints. And *ah señor, el paisano* performs his good deeds as a gentleman and a Christian. Witness how he always leaves the sign of the cross in the sand with every step he takes!

Twentieth-century bird watchers, especially those from the North and East, are usually duly shocked to see this avian symbol of western deserts strolling near Florida style swamps in deep east Texas. Shock or no shock, however, tall pines and magnolias are almost as acceptable to the Roadrunner as are mesquites and pricklypear cactus. In short, this big cuckoo inhabits bare ground with more or less scattered trees and bushes where it can walk about freely; it is not much interested in botany. Although the habit of nest parasitism is widespread in Cuculidae, the Roadrunner seems to be without tendencies in this direction. However, veteran egg collector R. W. Quillin reported that he once found a Roadrunner egg and a Mockingbird egg together in a Mocker nest; this abnormal occurrence was near San Antonio, Texas, May 27, 1913. Sometimes a few birds gather together, but the species is usually seen singly or in pairs.

Roadrunners are seldom on the wing; flight appears fitful and is seldom long sustained. When pursued, a sprinting bird usually takes to the air briefly for a crashing dive into brush for concealment. The Roadrunner zips along a trail or road—measured by auto speedometer at 10 to 15 m.p.h.—with head and tail parallel to the ground when running at top speed. Sometimes the bird comes to a sudden standstill, raises its tail, crest, and head, and peers about wide-eyed. Prey chasing involves many abrupt changes of direction, often through thickets or clumps of cactus, as the bird runs down lizards (including horned toads), small snakes (yes, the bird really does catch and eat rattlesnakes, but not big ones), grasshoppers, crickets, scorpions, centipedes, snails, mice, and a few eggs and small birds. When caught, food is typically beaten to limpness on the ground or a rock, then gulped down headfirst. A captive Roadrunner in California's San Diego Zoo specialized in catching intruding House Sparrows. The individual was always careful to pick off wing and tail feathers before it swallowed the carcass; this action was watched repeatedly in 1960 by E. B. Kincaid, Jr. The Roadrunner also eats various fruits and seeds, even pricklypear. Sunning, especially early in the morning, is a standard activity; from atop a mesquite or on the ground, the bird spreads its wings and loosens its feathers to expose the bare skin on its back and rump to the warm rays.

The springtime territorial-courtship call of the male Roadrunner, delivered usually at sunrise from a mesa rim, dead tree, or tall cactus, is a slow, throaty, dove-like *coo, coo, coo, oooh, oooh, oooh*, etc., becoming





Roué Agassiz Puertes.

Roadrunner, *Geococcyx californianus*

slower and descending in pitch. The bird begins his vocalization with bill almost touching his toes, but throws his head back until the beak points up as the *oooh*'s progress downward. Through the year, Roadrunners also make vibratory *perrp*, *perrp*, *perrp* noises, said to be made by rolling their mandibles together; even young birds just out of the nest make this sound. Nestlings utter a strong buzzing when begging for food.

DETAILED ACCOUNT: TWO SUBSPECIES

CALIFORNIA ROADRUNNER, *Geococcyx californianus californianus* (Lesson)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Crown black, more or less metallic blue or purplish black, anteriorly duller, feathers broadly spotted or streaked with russet, light tawny brown, or pale buff; hindneck and upper back black or blue-black, feathers with broad lateral edgings of tawny brown and pale buff; middle of back and scapulars similar, but centers of the feathers more or less metallic dark dull olive green or bronzy; rump dull hair brown; upper tail-coverts and middle pair of rectrices bronzy purplish olive, narrowly margined with white; remainder of tail rather metallic blue-black on outer webs, inner webs more greenish, three outer feathers with broad tips of white, these much longer on outermost rectrix; primaries fuscous black, rather lighter on inner webs, and on inner primaries more or less glossed with metallic dull olive green, becoming more bluish on innermost primaries and secondaries; outermost primary edged with white on outer web, remainder with median and terminal white streak on outer webs, inner secondaries margined with white on terminal portions of outer webs; tertials, which are more rufescent bronze, margined with white on both webs; greater wing-coverts bronzy olive green like secondaries and broadly tipped with white; remainder of wing-coverts like back, but edgings broader and more whitish; sides of neck like back, but dark centers of feathers narrower, russet margins broader; cheeks dull white, somewhat streaked with dull black and slightly tinged with pale buff; ear-coverts chaetura black with fine streaks of dull white; chin dull white centrally with area of chaetura black streaks mixed with white on each side; upper throat and jugulum light dull cinnamon buff and cinnamon, paler medially, with edgings of dull white and shaft streaks of fuscous black; remainder of lower surface dull grayish white or dull pale grayish buff; lining of wing fuscous. Bill dull blackish brown, slate color, or brownish black, mandible pale bluish at base; iris straw yellow, orange-red, or light grayish brown; narrow ring next to pupil yellow; bare orbital space sky blue to indigo anteriorly, bluish white below and behind eye, hindmost part dark or bright orange or orange-red; legs and feet light dull blue, slate gray, or dark dull brown, larger scales dull yellow or cream color in front; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Practically identical with nuptial adults. *First winter:* Acquired by partial postjuvenile molt. Like adults in winter, but tail feathers averaging somewhat narrower, and some feathers retained from juvenile. *Juvenile:* Acquired by postnatal growth. Similar to nuptial adults, but bill shorter; colors of upper parts and anterior lower parts duller; markings less distinct; jugulum more grayish, with less cinnamon or buff. *Natal:* Bird hatched unfeathered, except for a few scattered white hairlike feathers, these almost absent on posterior upper parts and very short and inconspicuous on entire under surface. Skin dark brown.

MEASUREMENTS: *Adult male:* Wing, 163.6–189.0 (average, 174.5) mm.; tail, 260.1–300.0 (278.4); bill (exposed culmen), 42.9–57.9 (49.8); height of bill at base, 15.0–17.0 (15.7);

tarsus, 57.4–64.0 (60.7); middle (outer anterior) toe without claw, 30.5–36.1 (33.3). *Adult female:* Wing, 160.0–179.1 (169.4); tail, 258.0–290.1 (271.0); bill, 45.5–51.1 (47.3); height of bill, 14.0–16.0 (15.2); tarsus, 57.9–62.0 (59.4); middle (outer anterior) toe, 31.0–33.5 (32.3).

RANGE: N. California to s. Kansas, south to s. Baja California, Michoacán, and s. Veracruz.

TEXAS: *Resident:* Altitudinal breeding range, about 700 to 6,800 ft. Collected in northern Texas, north to Oldham (eggs) and Hemphill, east to Cooke cos.; and in Trans-Pecos, in Pecos, Brewster, Presidio, Jeff Davis, Culberson, and El Paso (ca. 1853) cos. Locally fairly common.

NESTING: *Nest:* On mesas, lowlands, or lower mountain slopes; in scattered forests, or open country where there are trees or bushes; in low tree, bush, or even hollow dead stump, usually near trunk of tree; shallow and often loosely constructed platform, usually well concealed; composed of sticks, grass, and weed stalks; lined with small twigs, grass, bark, feathers, bits of snake skin, or reeds. *Eggs:* 2–13, usually 4–6; short ovate to elliptical ovate; pure white or buffy white, unspotted, with overlying film of pale yellow; average size, 38.9 × 29.7 mm.

TEXAS ROADRUNNER, *Geococcyx californianus dromicus* Oberholser, new subspecies (see Appendix A)

DESCRIPTION: *Adults, nuptial plumage:* Similar to *G. c. californianus* but smaller, especially wing, tail, and bill; outermost pair of tail feathers with longer white tips; entire upper surface verging somewhat darker.

MEASUREMENTS: *Adult male:* Wing, 154.9–168.9 (average, 163.3) mm.; tail, 243.1–277.1 (254.3); bill (exposed culmen), 45.0–52.1 (47.3); height of bill at base, 15.5–16.5 (16.0); tarsus, 56.9–65.0 (59.7); middle (outer anterior) toe without claw, 28.9–35.1 (33.3). *Adult female:* Wing, 154.9–167.1 (160.8); tail, 235.0–263.1 (248.2); bill, 41.7–49.0 (46.5); height of bill, 14.0–16.0 (15.2); tarsus, 57.4–60.5 (59.2); middle (outer anterior) toe, 27.9–33.5 (31.8).

TYPE: Adult male, no. 140803, U.S. National Museum; Brownsville, Texas; Feb. 12, 1894; J. A. Loring.

RANGE: C. Texas and w. Arkansas, south to c. Nuevo León and c. Veracruz.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to about 3,000 ft. Collected north to Dallas (ca. 1880), east to Montgomery, south to Cameron, west to Val Verde and Martin cos. Common.

NESTING: Similar to that of *G. c. californianus*, but average egg size, 39.4 × 29.9 mm.

[SMOOTH-BILLED ANI, *Crotophaga ani* Linnaeus

Ani of various authors. Closely resembles smaller Groove-billed Ani, but lacks grooves on bill; ridge on top of upper mandible is higher and more steeply curved; plumage usually more glossy, nape feathers tipped with bronze instead of gray. Anis in field best separated by voice: Smoothbill's whining, metallic whistle ascending in pitch contrasts with Groovebill's soft, liquid double note descending in pitch. Length, 13½ in.; weight, 3¼ oz.

RANGE: S. Florida, West Indies, and islands off east coast of Yucatán Peninsula and Central America; also Panama (including Pearl Islands), south along Pacific coast to Ecuador, and from Trinidad and n. coast of South America, south (east of Andes) to n. Argentina and s. Brazil.

TEXAS: *Hypothetical:* Four careful sightings in southeastern corner: Jefferson Co., north of Beaumont to-

ward Pine Island Bayou (Feb. 17, Apr. 1, 1939, Bessie M. Reid); Chambers Co., vicinity of Cove (Oct. 10 and 14, 1948, A. K. McKay).]

GROOVE-BILLED ANI, *Crotophaga sulcirostris*
Swainson

SPECIES ACCOUNT

An all-black (partly glossy) cuckoo whose large, laterally compressed bill (with grooves on upper mandible) appears rounded in profile. Has short, rounded wings; long, mobile tail. Length, 13½ in.; wingspan, 16; weight, 2¾ oz.

RANGE: S. Sonora and s. Texas, south generally through lowlands of Mexico, Central America, and n. South America to n. Chile on west coast and Guyana on north coast; also Curaçao and Trinidad; formerly Cape district of Baja California. Largely resident, but some postbreeding individuals along northern limits retreat southward while others disperse northward, a few very irregularly reaching Arizona, Nebraska, Minnesota (accidental), and Florida; some regularly remain to winter along n. Gulf coast, chiefly in Texas and Louisiana.

TEXAS: (See map.) *Breeding:* Early May to mid-Sept. (eggs, May 16 to July 10; young in nest as late as Sept. 11) from near sea level to 400 ft. Common to uncommon in south Texas from Laredo (nesting suspected), Hebbronville (nesting very likely), Alice, and Corpus Christi south to mouth of Rio Grande; somewhat irregular along northernmost limits; rare

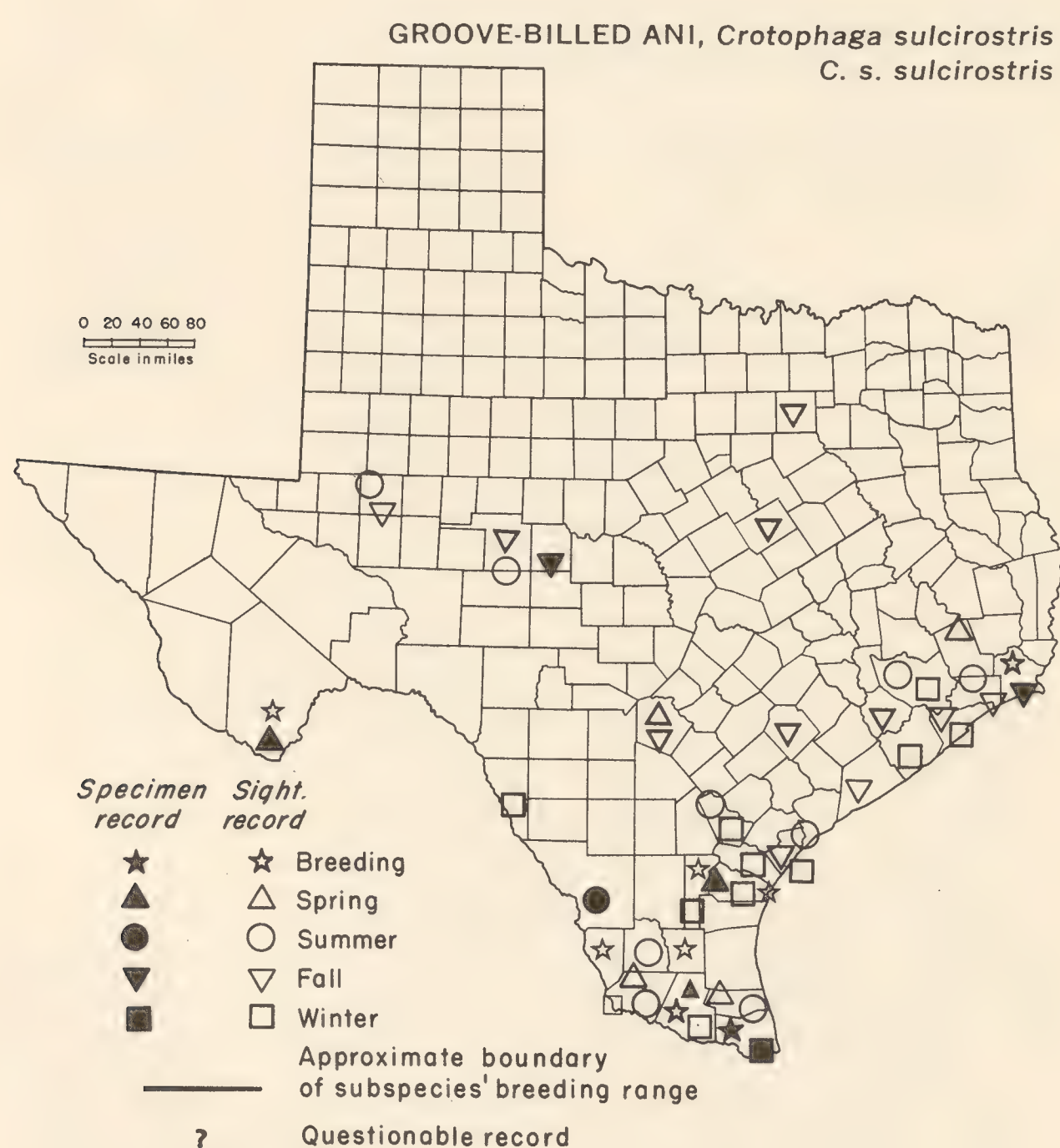
and highly irregular at Big Bend Nat. Park and in southeastern corner of state. *Winter:* Late Sept. or early Oct. to late Apr. (extremes: Aug. 23, May 19). Locally fairly common to scarce in Rio Grande delta (north to Falcon Dam, Alice, and Beeville) and along coast to Louisiana border; rare upriver to Eagle Pass. Casual vagrant (chiefly in fall) as far north as Midland, Concho Co., Waco, and Dallas.

HAUNTS AND HABITS: Even by cuckoo standards, the Groove-billed Ani is an odd bird. This hot-country land dweller with a lizardlike facial expression has a beak shaped like that of a puffin, a bird of cold seas. Even though a weak flier, supposedly resident only in the Neotropics, this ani has a long history of making sudden appearances in such decidedly untropical places as Minnesota, Nebraska, and Kansas. Also, the Groovebill is both an orthodox one-pair-per-nest breeder and a communal nest builder and tender.

This ani exhibits possibly still another inconsistency. The bird seems to use a somewhat different habitat in Texas from the one it prefers in Mexico. In Texas, the Groovebill appears to stay on or even within the thickest thornbrush it can find: patches of Texas ebony (*Pithecellobium flexicaule*) and mesquite (*Prosopis glandulosa*), also resaca-side huisache (*Acacia farnesiana*) and retama (*Parkinsonia aculeata*) bushes. In Mexico and Central America, this ani seems to be most at home in grassy cattle pastures with only very scattered bushes; in this tropical climate every cow has at least one of these birds at her feet. Where the species is numerous, birds are frequently seen in small, scattered flocks even in the breeding season; in Texas and northeastern Mexico, individuals group chiefly in the cooler months.

Flight of the Groove-billed Ani is distinctive; this and the high-arched bill are the chief field marks separating it from the Great-tailed Grackle, which bird it seems to mimic in appearance. The ani jumps into the air from a thorny bush, gives a few quick flaps, then sails for two feet or more, gives another burst of quick flaps, then sails, etc. Upon arriving at the next bush, the bird lands, at which time the long, loose tail flops forward over the bird's back—sometimes almost toppling said ani off its perch. When the bird settles down, it picks insects off leaves. Grasshoppers it catches in great numbers on the ground, often at the feet of cattle or other livestock; termites (some snatched from air!), roaches, spiders, small lizards, and even berries are eaten also. The species' almost universal reputation as a great tick eater—commemorated in its genus, *Crotophaga*, and its Spanish name, *garrapatero*—is exaggerated, according to A. F. Skutch who has made thorough studies of the Groovebill.

Often delivered from a perch is this ani's chief call: a repeated *pee-oh* or *tee-ho*, with first note high and thin, second low. In flight, soft clucking and chuckling sounds issue from the bird's throat. All vocalizations are heard through the year, but the *pee-oh* seems to be more frequent in warm weather.



DETAILED ACCOUNT: ONE SUBSPECIES

COMMON GROOVE-BILLED ANI, *Crotophaga sulcirostris sulcirostris* Swainson

DESCRIPTION: *Adults, nuptial plumage*: Acquired by partial prenuptial molt. Maxilla with three or four curved grooves running parallel with culmen. General color of upper and lower parts dull black with metallic gloss of dull purple on wings; tail, lower back, rump, upper tail-coverts, and lower surface duller and with slight greenish sheen in places; feathers of anterior upper parts, including scapulars, and of anterior lower parts, with V-shaped terminal markings of metallic dull bronzy olive green, these framed by lateral edges on terminal portions of feathers. Bill black; bare skin of face dull black; iris dark brown; legs and feet black. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults. *Second winter*: Acquired by complete postnuptial molt. Like adults in winter. *First nuptial*: Acquired by partial prenuptial molt. Like nuptial adults, except for somewhat narrower tail feathers. *First winter*: Acquired by partial postjuvinal molt. Practically identical with first nuptial male and female. *Juvenal*: Acquired by postnatal growth. Similar to nuptial adults, but bill smaller and without

parallel grooves; upper and lower surfaces of body duller—fuscous above, bone brown below; feathers soft and with little or no metallic gloss; chin paler fuscous or hair brown. *Natal*: None. Bird hatched unfeathered; skin black.

MEASUREMENTS: *Adult male*: Wing, 130.0–156.9 (average, 141.7) mm.; tail, 160.0–194.1 (179.6); bill (exposed culmen), 24.9–29.9 (28.2); tarsus, 31.0–36.1 (34.3); middle (outer anterior) toe without claw, 22.1–25.4 (24.1). *Adult female*: Wing, 128.0–142.0 (133.9); tail, 160.0–182.1 (167.6); bill, 24.9–28.9 (26.7); tarsus, 31.0–35.6 (33.8); middle (outer anterior) toe, 21.1–25.4 (23.4).

RANGE: Identical with that of species with exception of Baja California.

TEXAS: *Breeding*: Collected in Brewster, Webb, Hidalgo, Cameron, and Nueces cos. *Winter*: Taken in Jefferson (Nov. 8) and Cameron cos.; inland in Concho Co. (Oct.).

NESTING: *Nest*: In scrub, or low woodlands, in river valleys; loose bulky basket; composed of twigs, thorns, leaves of cane, and similar materials; lined with roots and fresh green leaves. *Eggs*: 3–6, 14 (larger number laid by more than one female), often 3–5; oval or ovate, sometimes elliptical oval or elliptical ovate; glaucous greenish blue, covered with white chalky deposit; unspotted; average size, 31.2 × 23.9 mm.

Barn Owls: Tytonidae

BARN OWL, *Tyto alba* (Scopoli)

SPECIES ACCOUNT

See frontispiece, vol. 1

A medium-sized, nocturnal bird of prey that resembles typical owl, but has long, heart-shaped face, comparatively small, deep-set dark brown or black eyes; relatively small external ear openings; no ear-tufts; and long legs with bristly-feathered toes and comb-edged middle claws. Largely golden buff above intermixed with gray and mottled with black and white; usually white or buff below finely speckled with blackish; has blackish-rimmed white or buff facial disks. When flying overhead at night, it appears ghostly white. Length, $15\frac{3}{4}$ in.; wingspan, $3\frac{3}{4}$ ft.; weight, $13\frac{1}{2}$ oz.

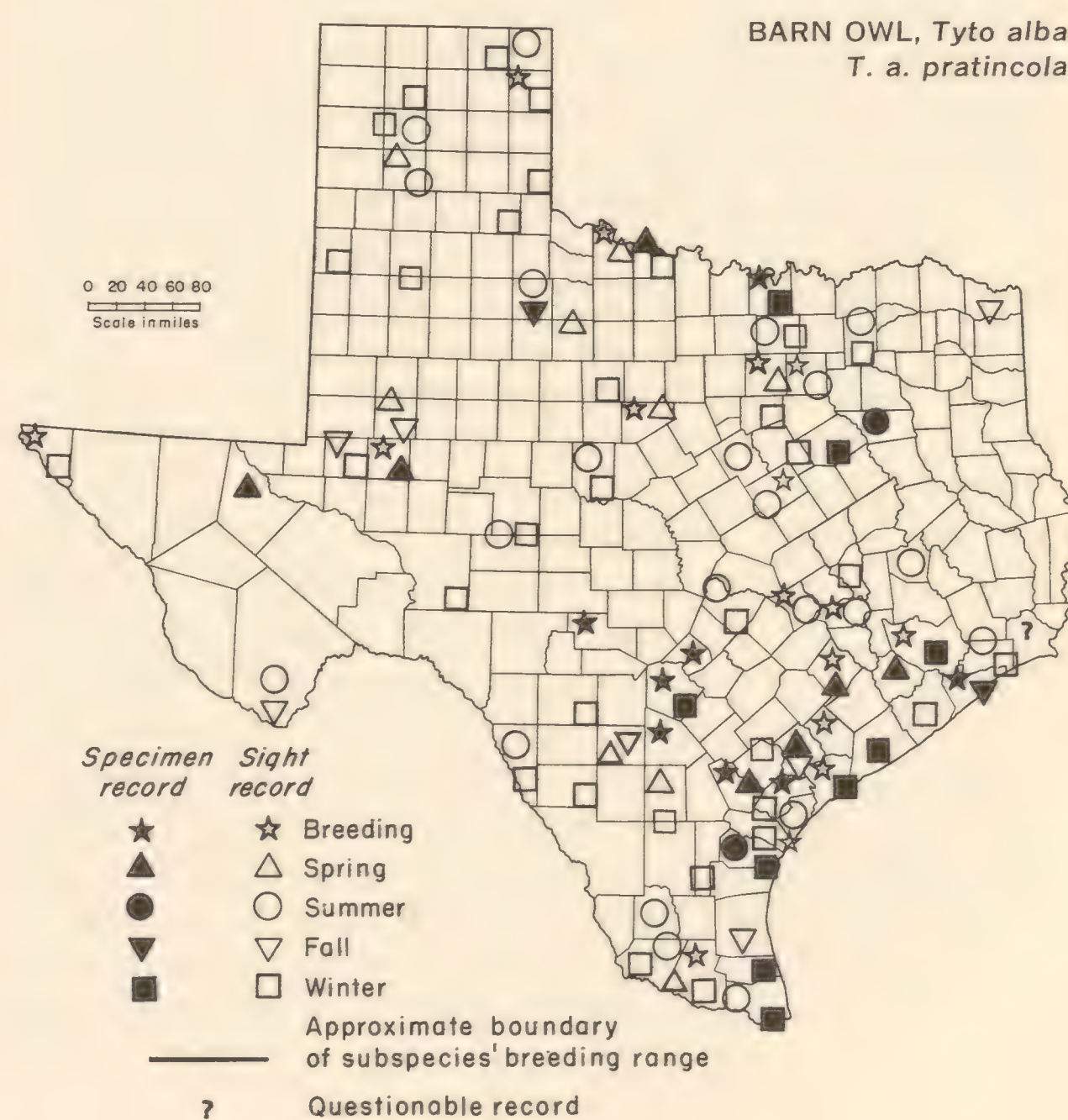
RANGE: Virtually cosmopolitan; in Western Hemisphere from s. British Columbia and Dakotas to s. Great Lakes region and s. New England, south widely through both Americas (including many offshore islands) to Tierra del Fuego; also West Indies. Introduced in Hawaii.

TEXAS: (See map.) *Resident:* Breeds virtually year-round, but mainly early Nov. to mid-July (eggs, Nov. 13 to May 16; young in nest as early as Nov. 13) from near sea level to about 4,500 ft. Fairly common to uncommon in most parts. Status in much of Trans-Pecos somewhat uncertain, but species is apparently of scarce occurrence, except near El Paso (where it is fairly common to uncommon).

HAUNTS AND HABITS: The Barn Owl is that great rarity, a land bird which ranges naturally on all continents (except Antarctica) and most large islands; it is remarkable that this largely nonmigratory species was able to disperse over the planet, especially since none of the other ten members of Tytonidae ever got around much. In Texas, as elsewhere, *Tyto alba* flourishes best in warm open or semiopen lowlands; it avoids very cold climates and high mountains. Shunning dense woodlands, this bird flies over scattered trees, prairies, meadows, marshes, and seashores—where it finds an abundance of small mammals on which to prey. In the Southwest it seeks arroyos, gullies, cliffs, canyons, mesquite and other brushland. It frequently haunts barns and outbuildings of farms, ranches, and towns. Although more numerous about human habitations than most other owls, it often goes unnoticed because of its silent flight and very noctur-

nal habits. During the breeding season it is nongregarious; in winter several individuals may share a favored roost.

Noiseless flight on long, broad wings is graceful, buoyant, and can be dashing. Barn Owls often begin to hunt in early twilight. Foraging lasts through the night when both parents are working hard to feed their three to eleven ravenous nestlings—usually of various ages, since the female begins incubation with the first egg instead of waiting until the clutch is complete. The Barn Owl's keen eyesight and hearing allow it to search even in the blackest hours of night for mice, rats, shrews, rabbits, roosting birds (usually Starlings or House Sparrows), and an occasional insect. The owl is able to see in the dimmest light; however, by using its ears alone to detect faint mouse footsteps in leaf litter it can locate its prey in total darkness, as demonstrated by controlled experiments at Cornell University at Ithaca, New York, and the Hatheway School of Conservation in Massachusetts. After a silent plunge, the Barn Owl pins the rodent to the ground with its talons. The bird may gulp its prey headfirst or hold it in its beak as



it flies back to feed the young. Owls which have eaten whole rodents cough up indigestible remains in the form of pellets; those of the Barn Owl are rounded, blackish, and shiny, as if varnished.

Roosts during the day are usually in a cave, burrow, crevice in the side of an arroyo, hollow tree trunk, thick foliage of a palm or other tree, or in a dark corner of an abandoned or infrequently used building or mine shaft. If a mammalogist is lucky enough to find the roost of a Barn or other quadruped-eating owl, he can quickly gain a good knowledge of the local small mammal population merely by examining the skulls and hair contained in the pellets. An adult Barn Owl on average ejects two pellets in a twenty-four-hour period, one of them at the roost.

The Barn Owl is generally rather quiet, but when the bird is flying about at night it utters, usually about once every twenty minutes, an eerie, long, drawn-out shriek or rasping screech. Thus the Barn, unlike other U.S. owls, emits its most frequently heard note on the wing. In and near a nest, both old and young make hissing and snoring sounds; when cornered, a Barn Owl, like other owls, may snap its bill loudly and rapidly.

DETAILED ACCOUNT: ONE SUBSPECIES

AMERICAN BARN OWL, *Tyto alba pratincola* (Bonaparte)

DESCRIPTION: *Adult male, nuptial plumage (ochraceous phase):* Acquired by wear from winter plumage. Upper parts, including wings, ochraceous buff or orange ochraceous, so much overlaid with finely mottled hair brown that it almost obscures ground color; also sprinkled with larger spots of hair brown and dull white; tail ochraceous buff to white, outer tail feathers paler and becoming white on basal portions, marked with rather narrow mottled bars of hair brown, this color also more or less mottling ochraceous bars; wing-quills similar to tail, inner webs of feathers white basally but also barred with hair brown; face white, more or less tinged with vinaceous brown; edges of facial disks deep ochraceous buff or orange ochraceous and more or less tipped with fuscous or fuscous black; lower surface ochraceous or ochraceous buff with numerous roundish spots of fuscous; lining of wing white with more or less tinge of

ochraceous in places and roundish spots of hair brown. Bill dull pearly white to vinaceous pink; cere pale brown; eye-ring vinaceous; iris chocolate or black; legs hair brown; feet light brownish yellow or auburn; claws auburn, slate color, seal brown, or black. *Adult male, nuptial (light phase):* Like ochraceous phase, but upper parts and face much paler; tail exceedingly whitish; wing-quills with greater area of white; lower surface almost pure white with a few roundish spots of hair brown or none at all. *Adult male, winter:* Acquired by complete postnuptial molt. Like corresponding phase of nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to corresponding phase of nuptial adult male but averaging darker. Bill vinaceous buff, becoming white at tip; cere vinaceous buff; claws bone brown. *Adult female, winter:* Acquired by complete postnuptial molt. Like corresponding phases of nuptial adult female. *Male and female, second winter:* Acquired by complete postnuptial molt. Like corresponding sex and phase of adults in winter. *Male and female, first nuptial:* Acquired by wear from first winter, with which it is identical. *Male and female, first winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adults in winter, but with more buff; fine dots on upper surface less extensive; crown and hindneck not uniform with back, but cinnamon buff or cream buff with some spots of black and gray. *Juvenal* (second natal down of most authors): Acquired by complete postnatal molt. Entirely cream white or buffy white or light to pale pinkish buff, lightest posteriorly, the lower parts buffy white. *Natal:* Pure white. Bill and claws flesh color; iris black.

MEASUREMENTS: *Adult male:* Wing, 313.9–344.9 (average, 328.7) mm.; tail, 126.0–152.4 (138.2); bill (culmen from cere), 21.1–23.9 (22.1); height of bill at base, 15.0–17.0 (16.3); tarsus, 67.6–77.5 (73.2); middle toe without claw, 34.0–41.4 (37.6). *Adult female:* Wing, 320.0–358.4 (336.8); tail, 127.0–157.5 (141.2); bill, 21.1–23.6 (22.6); height of bill, 15.5–18.0 (16.8); tarsus, 66.5–80.0 (72.2); middle toe, 35.6–40.9 (38.9).

RANGE: S. British Columbia to s. Colorado, North Dakota, s.e. South Dakota, and s.w. Vermont, south through s. United States, Baja California, and mainland Mexico to Guatemala and Nicaragua (probably).

TEXAS: *Resident:* Collected north to King, Wichita, and Cooke, east to Henderson, Harrison, and Galveston (eggs), south to Cameron, west to Reeves cos.

NESTING: *Nest:* In lightly wooded or open country, along streams, in cultivated areas, or on mesas; in hollow tree, hole or crevice in bank, ground, or building, on flat roof, frequently in tree duck nesting box, at times in discarded nest of crow or other bird; slight nest, made of rubbish and chips. *Eggs:* 3–11; one record of 24, usually 5–7; ovate, sometimes elliptical ovate, or elongate ovate; white or buffy white, unmarked; average size, 42.4 × 32.5 mm.

Typical Owls: Bubonidae

SCREECH OWL, *Otus asio* (Linnaeus)

SPECIES ACCOUNT

A small typical owl with large head, prominent ear-tufts, and short neck. Its big, forward-directed yellow eyes are close-set in large, round, black-rimmed facial disks. *Gray phase* (usual in Texas): mottled gray or brownish gray, finely barred and streaked with whitish below. *Rufous phase*: rich reddish brown or brown instead of gray. Length, 8½ in.; wingspan, 22¼; weight (*O. a. cineraceus*), 4¼ oz.

RANGE: S.e. Alaska and extreme s. Canada, south through United States to s. Baja California, central highland and n.e. Mexico, Gulf states, and Florida. Closely related forms range through other parts of Mexico and Central America to Costa Rica.

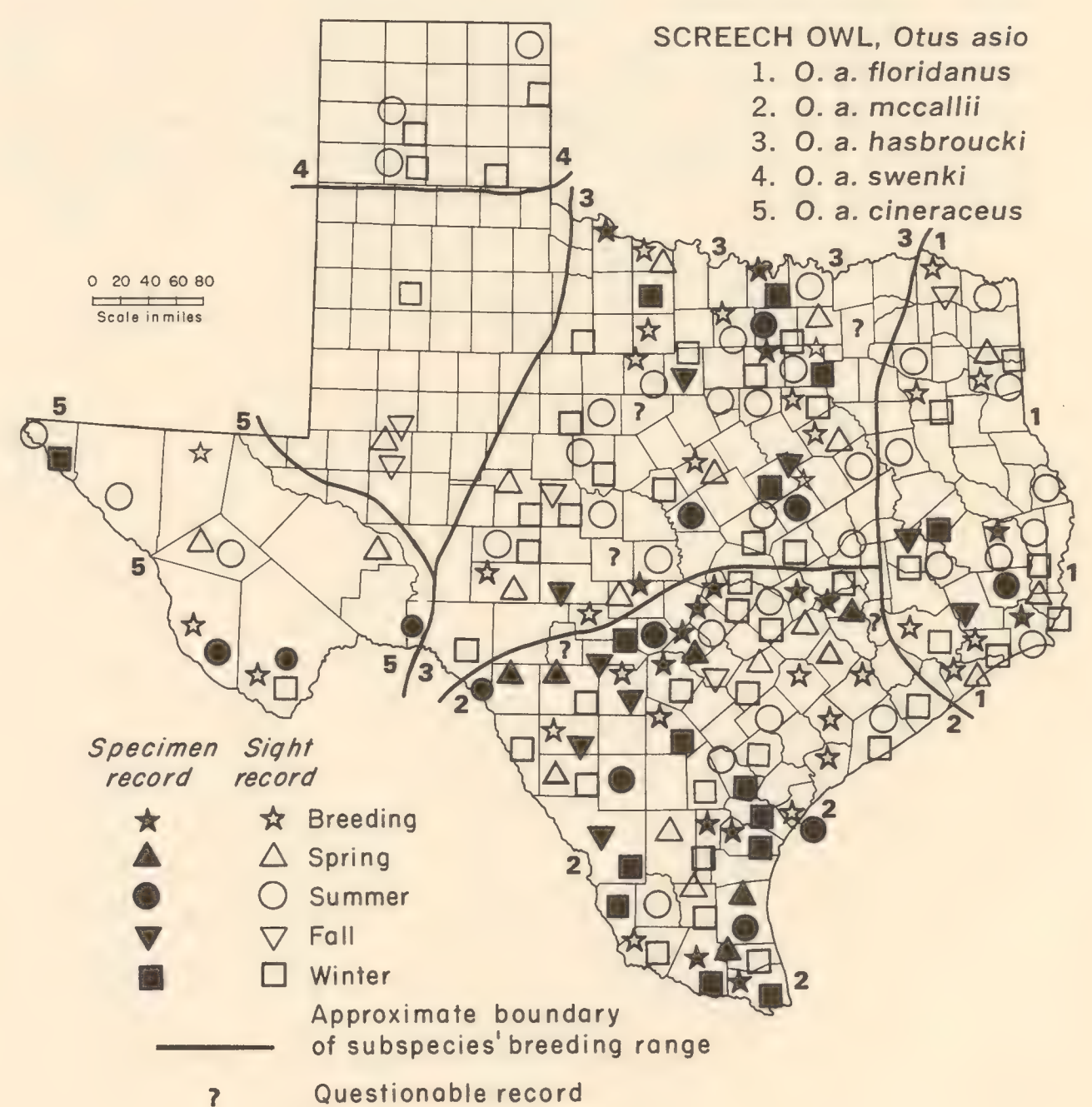
TEXAS: (See map.) *Resident:* Breeds, early Feb. to mid-July (eggs, Feb. 12 to June 14; young being fed as late as July 9) from near sea level to 7,500 ft. Common to uncommon in most parts, but largely absent from middle and southern Panhandle (breeding unconfirmed), where rare.

HAUNTS AND HABITS: The fierce little Screech Owl is a good example of the world's 123 typical owls; it can draw blood from people and other animals that approach its nestlings too closely. Like its large cousin the Great Horned Owl, the misnamed Screech is adaptable to a wide range of habitats; however, unlike *Bubo virginianus*, it has not colonized South America and it requires at least a few clumps of trees in its landscape. In one respect though, *Otus asio* is more versatile than its big relative; it is the only Texas owl which commonly nests in shade trees and wooded parks within cities. Not normally gregarious, it is usually seen singly, in pairs, or in family parties.

As with most owls, flight on broad, rounded, soft-margined wings is noiseless and swift when occasion demands. On nocturnal forays through woodlands, the bird adroitly avoids tree branches as it hunts rats, mice, moles, birds, lizards, and fish on ground or in water; beetles, locusts, crickets, cicadas, other insects, and spiders are gulped in mid-air or snapped off leaves and flowers of trees and shrubs. A keen sense of hearing as well as sharp eyesight aid the Screech Owl in locating, then quickly grabbing in its sharp talons, rustling night creatures, splashing fish, or whirring insects. Daytime is spent in seclusion of a tree cavity,

amid dense foliage, or in a cranny of a cave or cliff. When Blue Jays discover a sleepy Screech Owl, they often heckle it in the same way that Common Crows annoy Great Horned and Barred owls. Other small woodland birds at times gather around and fuss at a Screech Owl careless enough to expose itself in daylight. Bird watchers make use of this habit by imitating the call of their local form of *Otus asio*—especially in regions where the more easily mimicked Pygmy and Ferruginous owls are absent or rare—and thus often draw a variety of birds within viewing range.

Screech Owls utter various sounds, not one of which could be called a screech. In most of Texas, as in the whole eastern half of the United States, Screech Owls, regardless of subspecies, give as territorial and duetting calls (1) a long, tremulous whinny which rises at first then descends; and (2) a single, long, unbroken trill on the same pitch. In striking contrast, western Screech Owls, regardless of race, emit (1) slow, but accelerating mellow whistles on one pitch which sound like rapping on wood; and (2) a two-part trill, the latter section longer than the first. Screech Owls are most vocal in fall, winter, and early spring.



CHANGES: Not until recent years was it realized that a western-voiced Screech Owl inhabits Texas. In 1961–62, Joe T. Marshall, Jr., and L. R. Wolfe established presence of *Otus asio suttoni* Moore, a strictly western race, along a 120-mile strip of the Rio Grande from Boquillas (Brewster Co.) to Langtry (Val Verde Co.). Since the mid-1960's, many bird students have unstopped their ears and discovered that at all altitudes in Big Bend National Park, the "wood-rapping" Sutton's Screech Owl is the dominant subspecies. At this writing (1971), it is unknown whether *suttoni* was overlooked prior to 1961 or whether it is a newcomer to Texas. Pureblood Sutton's is the darkest Screech Owl race and has a black bill, but in Big Bend it interbreeds with eastern-voiced, green-billed *mccallii* and possibly *cineraceus*, thus mongrelizing its appearance. For more details on races, vocalizations, and color phases of all Screech Owls, the reader is referred to Marshall's study (1967, *Parallel Variation in North and Middle American Screech-Owls*, Monographs Western Foundation of Vertebrate Zoology, no. 1).

DETAILED ACCOUNT: FOUR SUBSPECIES [PLUS ONE HYPOTHETICAL]

FLORIDA SCREECH OWL, *Otus asio floridanus* (Ridgway)

DESCRIPTION: *Adults, nuptial plumage (gray phase):* Acquired by wear from winter plumage. Upper parts, including wing-coverts, mouse gray to cinnamon drab, rather more grayish anteriorly, and finely mottled and vermiculated with dull black or chaetura black, and with central feather stripes of same, markings heaviest on pileum and hindneck; well-defined superciliary stripe mottled grayish white; conspicuous ear-tufts with outer webs like back, but inner webs dull white mottled and finely barred with dull black; upper surface of tail hair brown, rather narrowly barred with dull buff, avellaneous, or dull white, mottled also on middle feathers, terminally on all, with grayish white or pale buff, light bars on tail becoming white on inner portion of inner webs, particularly on basal part of feathers; wing-quills fuscous, outer primaries barred on outer webs broadly with white or cinnamon buff, and on inner webs with dull buffy avellaneous, secondaries with mottled bars of dull white or dull buff; face grayish white, much mottled with hair brown, edge of facial disks with more or less dull black, particularly on sides of head, where this forms more or less conspicuous bar; lower surface dull white more or less tinged with pale buff, particularly on abdomen and legs, feathers very narrowly barred or vermiculated with dull black, and with broader connected shaft streaks, these shaft markings heaviest on breast; lining of wing white or buffy white with a few mottlings of hair brown or fuscous. Bill and cere pea green, olive buff, bluish white, or pale greenish blue, but tip white, sometimes mandible bice green; iris straw yellow or lemon yellow; feet pea green, dull bluish white, ecru drab, or yellowish gray; claws ecru drab, but terminal portion seal brown. *Adults, nuptial (rufous phase):* Upper surfaces, including wings and tail, russet; tail narrowly barred with fuscous; inner webs of wing-quills broadly barred with same color; upper parts with very narrow shaft streaks of fuscous black or fuscous, thus much more uniform above than in gray phase; lower surface russet or dark russet, feathers more or less barred or mixed with white; legs tawny, more or less barred or mixed with cinnamon buff; lining of wing mixed tawny, cinnamon buff, and white. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of

NOTE: A description of *O. a. suttoni* is not included herewith since apparently Oberholser was not aware of this race.

nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like corresponding phase of adults. *First nuptial:* Acquired by wear from first winter, with which in corresponding phase it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by partial postjuvenal molt. Similar to adults in winter in corresponding phase, but still retaining wings, scapulars, and tail feathers from juvenal; primaries with no white on outer webs but broadly barred with cinnamon and fuscous; white tips of median and greater wing-coverts and white outer webs of scapulars smaller; middle pair of tail feathers more or less distinctly barred, lateral feathers more conspicuously barred, with dark brown. *Juvenal* (second natal down of most authors) *gray phase:* Acquired by complete postnatal molt. Upper parts hair brown, more or less barred with dull white; lower parts dull white, numerous and narrowly barred with hair brown; wings and tail similar to those of nuptial adults. *Juvenal (rufous phase):* Upper parts dull tawny or russet, more grayish anteriorly, and narrowly barred with white and dark brown; lower parts dull buffy white with narrow bars of tawny, russet, hair brown, or fuscous. *Natal:* All white. Bill and claws light gray, whitish at tips; iris yellow.

MEASUREMENTS: *Adult male:* Wing, 138.9–151.6 (average, 144.8) mm.; tail, 62.5–73.4 (66.8); bill (culmen from cere), 13.0–15.0 (13.7); height of bill at base, 11.9–13.7 (13.2); tarsus, 30.5–33.0 (31.8); middle toe without claw, 17.5–20.1 (18.8). *Adult female:* Wing, 144.0–162.6 (151.4); tail, 67.1–76.5 (71.4); bill, 13.5–15.5 (14.2); height of bill, 12.4–13.7 (13.2); tarsus, 29.9–35.1 (32.0); middle toe, 18.5–21.1 (19.6).

RANGE: S. Missouri, south to e. Texas, Alabama, and Florida.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to about 600 ft. Collected in Walker, Trinity, Tyler (eggs), Liberty, Hardin, and Jefferson (eggs) cos. Fairly common.

NESTING: *Nest:* In swamps, open woods, brush, timber along streams, orchards, or vicinity of dwellings; in hollow in tree or stub, usually not very high above ground, nook in a building, or birdhouse with large entrance hole; often with no nest material, but sometimes some straw, leaves, feathers, or rubbish. *Eggs:* 2–4, usually 3; nearly oval, often nearly spherical; a little glossy; white, usually smooth, unmarked; average size, 32.5 × 28.2 mm.

TEXAS SCREECH OWL, *Otus asio mccallii* (Cassin)

DESCRIPTION: *Adults, nuptial plumage:* Similar to *O. a. floridanus* but larger; upper parts paler; lower parts lighter and more heavily streaked, legs of paler rufous; in rufous phase also paler both above and below.

MEASUREMENTS: *Adult male:* Wing, 147.1–163.6 (average, 155.2) mm.; tail, 71.9–81.0 (75.7); bill (culmen from cere), 13.0–15.0 (14.0); height of bill at base, 12.4–13.5 (12.7); tarsus, 33.5–37.1 (35.1); middle toe without claw, 17.0–20.6 (19.3). *Adult female:* Wing, 149.1–163.1 (156.9); tail, 73.9–81.0 (78.2); bill, 13.5–15.5 (14.2); height of bill, 12.4–13.7 (13.2); tarsus, 34.0–38.1 (35.8); middle toe, 18.0–21.6 (19.8).

RANGE: S. Texas, south to w. Nuevo León and Tamaulipas.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 1,000 ft., perhaps slightly higher. Collected north to Travis, east to Lee and Washington (eggs), south to Aransas and Cameron, west to Val Verde cos. Fairly common.

NESTING: *Nest:* Similar to that of *O. a. floridanus*. *Eggs:* 2–5; nearly round; white, unmarked; average size, 33.5 × 28.9 mm.

HASBROUCK'S SCREECH OWL, *Otus asio hasbroucki* Ridgway

DESCRIPTION: *Adults, nuptial plumage:* Similar to *O. a. mccallii* but darker; averaging rather more grayish, less buffy above; bars on lower parts heavier and usually more numerous. In rufescent phase, colored like Eastern Screech Owl, *O. a. naevius*, of n.e. United States, but differing from that race in rather large size.

MEASUREMENTS: *Adult male:* Wing, 145.0–167.9 (average, 156.7) mm.; tail, 71.1–81.5 (75.7); bill (culmen from cere),

13.0–15.0 (14.2); height of bill at base, 10.9–14.0 (12.7); tarsus, 33.0–38.6 (35.8); middle toe without claw, 16.0–21.1 (18.5). *Adult female*: Wing, 152.9–178.1 (161.3); tail, 71.9–83.6 (78.0); bill, 13.0–16.5 (15.2); height of bill, 12.7–14.2 (13.2); tarsus, 35.6–39.1 (37.3); middle toe, 17.5–20.6 (18.8).

RANGE: C. Kansas to n.w. Arkansas, south to c. Texas.

TEXAS: *Resident*: Altitudinal breeding range, 350 to 2,000 ft. Collected north to Wilbarger (eggs) and Cooke, east to Dallas and Falls, south to Comal and Bandera, west to Kerr and Kimble cos. Fairly common.

NESTING: *Nest*: In open country or scattered woodlands, often along streams; usually in hollow of tree or stub; with wood chips, leaves, feathers, small twigs, grass, Spanishmoss, or shells of crayfish. *Eggs*: 3–6, usually 3–4; rounded oval; white, unmarked; average size, 34.0 × 28.2 mm.

[NEBRASKA SCREECH OWL, *Otus asio swenki* Oberholser

DESCRIPTION: *Adults, nuptial plumage*: Resembling *O. a. mccallii* but much larger; upper parts decidedly paler, black markings narrower; lower surface lighter, but markings coarser. Similar to Aiken's Screech Owl, *O. a. aikenii*, from c. Colorado, but smaller; in gray phase much paler above and somewhat so below; also more finely marked both above and below; face lighter and more whitish; in rufous phase also paler.

MEASUREMENTS: *Adult male*: Wing, 152.9–169.9 (average, 160.8) mm.; tail, 74.9–82.0 (78.7); bill (culmen from cere), 13.5–16.0 (15.2); tarsus, 35.1–39.9 (37.8); middle toe without claw, 17.0–20.1 (18.8). *Adult female*: Wing, 162.1–168.9 (164.8); tail, 79.0–85.6 (82.3); bill, 14.0–17.0 (15.7); tarsus, 36.1–39.6 (37.8); middle toe, 18.0–20.1 (19.0).

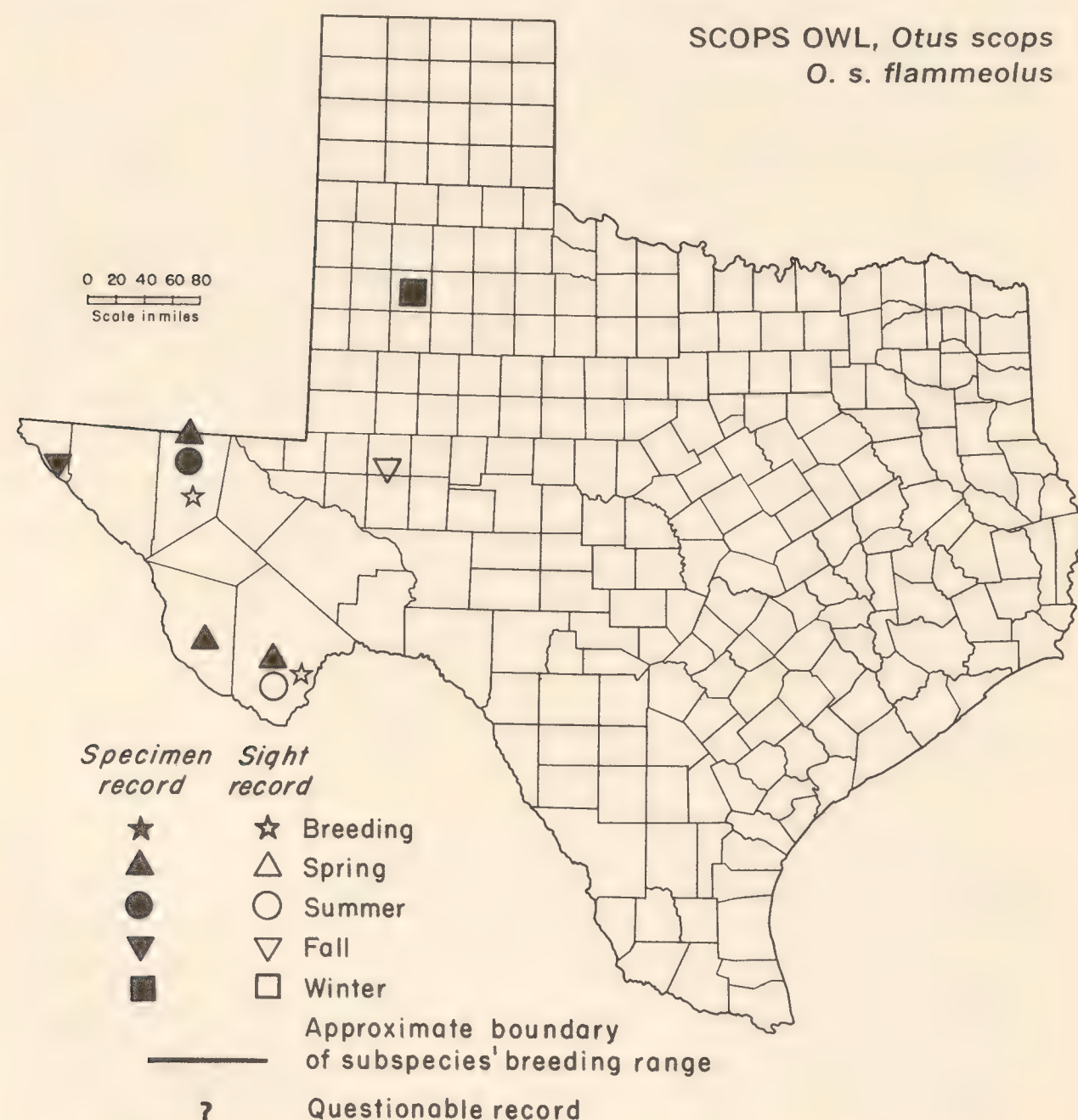
RANGE: S. Manitoba, south to n.w. Texas.

TEXAS: *Hypothetical*: No specimen or evidence of nesting, but following sight records considered to be of this subspecies: Lipscomb Co., Lipscomb, 2,430 ft. (male and female seen, late June, 1903, A. H. Howell); Potter Co., Amarillo, 3,676 ft. (reported, Feb. 2, 1921, A. J. Kirn); Randall Co., Canyon, 3,566 ft. (permanent resident, 1937, fide Miss A. I. Hibbetts). Status uncertain.

NESTING: Similar to that of *O. a. hasbrouckii*.]

MEXICAN SCREECH OWL, *Otus asio cineraceus* (Ridgway)

DESCRIPTION: *Adults, nuptial plumage*: Similar to Aiken's



Screech Owl, *O. a. aikenii*, from c. Colorado, but smaller; upper parts darker, markings narrower and finer; lower surface darker, including legs, markings finer and more numerous. Similar to *O. a. hasbrouckii* but smaller; lower parts darker, more finely barred and vermiculated; feet less ochraceous (more grayish).

MEASUREMENTS: *Adult male*: Wing, 145.5–159.5 (average, 152.7) mm.; tail, 71.9–83.1 (76.5); bill (culmen from cere), 11.9–14.0 (12.7); height of bill at base, 11.4–13.0 (12.2); tarsus, 33.0–38.1 (35.8); middle toe without claw, 17.5–20.1 (18.8). *Adult female*: Wing, 149.6–166.1 (156.4); tail, 71.9–80.5 (75.2); bill, 11.9–14.5 (13.5); height of bill, 11.9–13.5 (12.7); tarsus, 34.0–38.1 (35.1); middle toe, (20.1).

RANGE: S. Arizona, c. New Mexico, and Trans-Pecos Texas, south to n. Sonora and n. Coahuila.

TEXAS: *Resident*: Altitudinal breeding range, 1,200 to 7,500 ft. Collected in El Paso, Presidio, Brewster, and Val Verde cos. Fairly common.

NESTING: *Nest*: Resembling that of *O. a. floridanus*, but often placed in cavity in giant cactus (Arizona and Sonora) or in hole in riparian tree trunk; nest material scanty, mostly decayed wood and dead leaves. *Eggs*: 3–5, usually 3–4; white, unmarked; average size, 34.5 × 29.4 mm.

SCOPS OWL, *Otus scops* (Linnaeus)

SPECIES ACCOUNT

Considered a distinct species—Flammulated Owl, *Otus flammeolus*—by A.O.U. check-list, 1957 (see Appendix A). A tiny owl with dark brown (not yellow) eyes. Plumage closely resembles that of the larger Screech Owl, but Scops' shorter ear-tufts are seldom conspicuous; the face is usually noticeably edged with tawny and buff. Length, 6¾ in.; wingspan, 16¼.

RANGE: Parts of Eurasia, Africa; in North America from s. British Columbia, south through mountains of w. United States and Mexico (very locally) to highland Guatemala. Partial migrant in Old World; in North America winter range imperfectly known, but northern race apparently winters mainly south of United States, perhaps as far as Guatemala.

TEXAS: (See map.) *Breeding*: Summers from Mar. 20 to Sept. 24, but actual nesting evidence very scarce (fledgling located in McKittrick Canyon, Guadalupe Mts., 1960, F. R. Gehlbach; immature observed in Boot Canyon, Chisos Mts., June 8, 1968, R. H. Wauer). Fairly common locally to uncommon in high (above 6,000 ft.) mountains of Trans-Pecos, chiefly Guadalupe and Chisos ranges; irregular in Chinati Mts. (nesting unconfirmed); no record for Davis Mts. *Migration*: Sept. 3 to Oct. 16; no spring record outside summer range. Rare at El Paso; casual at Midland (1 captured, Oct. 7, 1964, Ola D. Haynes, et al.). *Winter*: Accidental at Lubbock (see detailed account).

HAUNTS AND HABITS: The American race of this small, brown-eyed owl lives high in mountains and canyons of western North America. This bird favors woods where western yellow pines (*Pinus ponderosa*) dominate; apparently an understory of bushes must be present beneath these trees. Like owls in general, it is found singly or in pairs.

On the wing, the Flammulated maneuvers adeptly through upper branches of trees as it hawks crepuscu-

lar and nocturnal moths, butterflies, beetles, and other insects; almost entirely insectivorous, it also gleans crickets, grasshoppers, ants, and spiders from forest foliage. When mountain madrones (*Arbutus*) are in flower, they usually attract many nocturnal insects; often one or two Flammulated Scops flutter quickly over the leaves and blossoms of a single tree, snatching up insects at a rapid rate. As a rule, this species fills its stomach at dusk, then flies rapidly to the top of a tall pine where it spends most of the night hooting. At dawn it feeds again. By day it secludes itself near the trunk of a densely foliated tree, usually a pine, oak, or alligator juniper (*Juniperus deppeana*), where with its barklike plumage the bird remains well concealed. Sometimes it appropriates rafters in the semidarkness of sheds or other outbuildings for roosting.

The call of the male Flammulated Scops Owl is a slow, single-noted *boot* (also described as *whoot* or *hoot*); on moonlight nights during the breeding season this mellow, ventriloquistic note is repeated at measured intervals. Occasionally, one or two *boo*'s are heard preceding the hoot: *boo boot* or *boo boo boot*. The female's rarely heard vocalization is higher and more quavering.

DETAILED ACCOUNT: ONE SUBSPECIES

FLAMMULATED SCOPS OWL, *Otus scops flammeolus* (Kaup)

Also known as Flammulated Screech Owl.

DESCRIPTION: *Adults, nuptial plumage (gray phase):* Acquired by wear from winter plumage. Upper parts hair brown, finely vermiculated with grayish white, pale gray, and dull pale buff, and more or less washed on anterior parts with various shades of rufescent brown, the feathers with blackish shaft markings, heaviest on crown; superciliary region paler and more grayish; hindneck with well-defined collar of rather large whitish spots or bars; back with some spots, particularly on scapulars, of white, cinnamon buff, or cinnamon; tail hair brown, much vermiculated with pale gray and narrowly barred with pinkish cinnamon or dull buff, becoming whitish on basal portion of outer feathers; wings hair brown, outer webs of outer primaries conspicuously barred with dull white or pale dull pinkish buff, remainder of wing-quills with mottled bars of pale gray or dull buff on outer webs, less conspicuous on inner webs, these bars on inner secondaries becoming white on inner edges of inner webs near base; upper wing-coverts similar to back, greater series with large spots of pale buff or dull white near tips; lining of wing mixed white, buff, and fuscous; facial disk dull white or dull buff, mixed and spotted with hair brown or fuscous, edge of disk tawny and buff, forming conspicuous bar on side of neck which is sometimes mixed with fuscous black; sides of neck and lower parts dull grayish white, finely barred and with broader connecting shaft streaks of fuscous or fuscous black, somewhat mixed with tawny and pale buff. Bill dark dull yellow, base darker; iris dark brown. *Adults, nuptial (rufous phase):* Upper parts mostly cinnamon brown, pileum with few or no blackish streaks; face bright cinnamon or cinnamon rufous; anterior lower surface much tinged with cinnamon or tawny; markings on both upper and lower parts less conspicuous. *Adults, winter:* Acquired by complete postnuptial molt. Like corresponding phase of nuptial adults. *First winter* (juvenile plumage of most authors): Acquired by partial postjuvenile molt. Like adults in winter in corresponding phase. *Juvenal* (second natal down of most authors): Acquired by complete postnatal molt. Upper parts hair brown, numerous bars with dull white on pileum and hindneck, more or less barred

with dull pale grayish buff on remainder of upper surface; lower parts buffy white, posteriorly pale buff, numerous bars with fuscous or hair brown. *Natal:* Pure white. Bill and feet flesh color; iris blackish brown.

MEASUREMENTS: *Adult male:* Wing, 128.0–137.9 (average, 133.4) mm.; tail, 56.9–63.5 (59.7); bill (culmen from cere), 8.6–10.4 (9.7); height of bill at base, 9.4–10.9 (10.2); tarsus, 23.1–24.9 (23.9); middle toe without claw, 12.7–13.7 (13.2). *Adult female:* Wing, 128.5–144.0 (135.4); tail, 57.9–67.1 (62.2); bill, 8.6–9.9 (9.4); height of bill, 9.4–10.9 (10.2); tarsus, 22.6–24.9 (24.1); middle toe, 13.2–14.2 (13.7).

RANGE: S. British Columbia to n. Colorado, south through w. United States and c. highland Mexico to Michoacán, State of México, and Veracruz. Apparently winters mainly in Mexico.

TEXAS: *Breeding:* Collected in Culberson and Brewster cos.; also taken in spring in Presidio Co., but nesting unconfirmed. *Migration:* Taken in El Paso Co. *Winter:* One specimen: Lubbock Co. (Dec. 7, 1950; G. M. Sutton collection).

NESTING: *Nest:* In forests of mountains, in canyons, or on mesas; in natural tree cavity or woodpecker hole; a few feathers and chips at bottom of cavity. *Eggs:* 2–4, usually 3–4; oval; white, with faint creamy tinge; unmarked; average size, 28.7 × 24.9 mm.

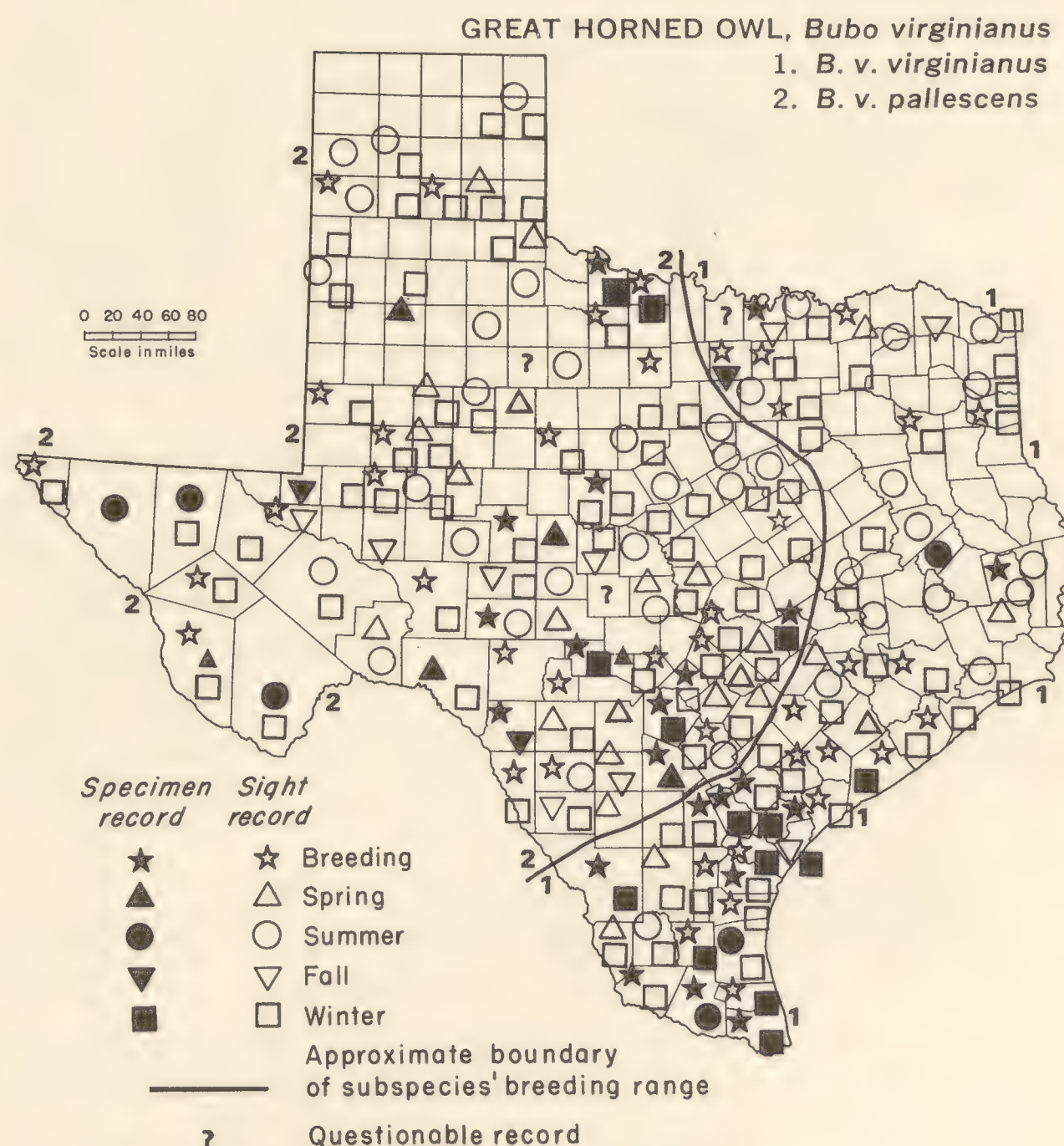
GREAT HORNED OWL, *Bubo virginianus* (Gmelin)

SPECIES ACCOUNT

A large owl with prominent ear-tufts ("horns"); enormous yellow eyes; black-rimmed tawny facial disks; black bill; conspicuous white throat-collar. Mottled brown above; heavily barred whitish below. Length, 21½ in.; wingspan, 4¼ ft.; weight, 3 lbs.

RANGE: New World (excluding West Indies) widely from tree-limit in Arctic to Strait of Magellan. Largely resident.

TEXAS: (See map.) *Resident:* Breeds, late Dec. to late July (eggs, late Dec. and Jan. 1 to June 12; young



in nest as late as July 8) from near sea level to 8,500 ft. Common to uncommon virtually throughout.

HAUNTS AND HABITS: The Great Horned Owl, a tiger of the air, is by a wide margin the most widespread and adaptable large owl restricted to the Western Hemisphere. Unlike so many other forms of life, it is not specialized in its habitat and food requirements. In subarctic and temperate North America, the bird lives everywhere from humid seashore through forest and brushlands to dry, rugged mountains. Within this broad spectrum, the Great Horned does have an optimum terrain: semiopen country with some hills, canyons (or at least gullies), and watercourses; most of Texas fits this description. In addition to its acceptance of many habitats, this species will catch and eat almost any living creature of its size or smaller. It relishes skunks, porcupines, cats, and various other organisms not commonly eaten by other raptors. Its wary nature and nongregarious habit render it hard to shoot; nobody ever killed a flock of Great Horned Owls by dynamiting their roost, as is often the case with crows. In Texas, as elsewhere, this owl seems altogether much better equipped to survive than are most other avian meat-eaters.

Flight of this powerful hunter is silent, strong, and often long sustained; the bird sails for considerable distances on motionless wings. With an almost uncanny ability, it weaves through branches of forest trees, as it searches for its favored prey. In addition to the aforementioned animals, it eats rabbits, squirrels, rats, mice, muskrats, weasels, various birds (including other owls and hawks), snakes, frogs, occasional insects, etc. At various times in the 1950's, the senior editor witnessed this heavy, clumsy-appearing bird easily catch bats in mid-air as they streamed out of the Devil's Sinkhole in Edwards County. Like other birds of prey, the Great Horned Owl often returns regularly to the same roost, the vicinity of which is strewn with feathers, bones, the owl's regurgitated pellets, and other remains of its meals. Although apparently preferring to hunt by night, it often does so by day, especially when feeding young. When resting during the day it secludes itself in foliage (dense, vine-tangled tops of evergreens being favored), in shallow caves, or on ledges of canyon walls or sinkholes.

Crows apparently have a great antipathy toward this species. In fact, when a crow discovers a roosting Great Horned, its outcry brings others to the scene apparently in an attempt to drive the owl away. *Cawing* and *caring* with great excitement, members of the flock surround the owl. Occasionally a crow will dart at the big bird, but the raven-hued one dares not get too close since the Great Horned sees well in daylight and does not mind eating crow!

The deep bass call of the Great Horned Owl, lower keyed and softer than that of the Barred, consists of five or six tremulous hoots unchanging in pitch: *hoo*, *hoohoo*, *hoo*, *hoo*. It has considerable carrying power and when heard from a distance has been described variously as sounding like a foghorn, train whistle,

dove's coo, or dog's bark. Seldom heard is its loud, frightening scream. Great Horned Owls are vocal all year but they hoot most frequently on clear nights in winter and spring.

DETAILED ACCOUNT: FOUR SUBSPECIES

EASTERN GREAT HORNED OWL, *Bubo virginianus virginianus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (dark rufous—normal—phase):* Acquired by wear from winter plumage. Upper parts, including wing-coverts, tawny or deep ochraceous underneath, feathers more or less completely overlaid with mottlings of fuscous black, dull white, and pale buff, and with shaft streaks of fuscous black; anterior part of crown and ear-tufts mostly fuscous black; middle tail feathers with mottled bars of dull pale buff or buffy white; rest of tail feathers broadly barred on inner webs with ochraceous buff or light buff and somewhat mottled with hair brown; outer webs similar to middle tail feathers except on two outer pairs; wing-quills fuscous, broadly crossed on outer webs with mottled bars of dull brownish buff, on inner webs with cinnamon buff or pale buff except at tips where bars are same as those on outer webs; face tawny, edges of feathers spotted with white and fuscous black; edge of wing white; chin white; upper throat somewhat streaked with fuscous; jugulum with broad white band; lower surface tawny or cinnamon rufous, posteriorly paling to cinnamon buff, heavily spotted with fuscous black on breast, remaining lower parts numerously barred with fuscous or fuscous black, these markings least conspicuous on mid-abdomen, crissum, and legs; feathered parts of toes almost white; lining of wing olivaceous tawny or deep cinnamon, spotted and barred with fuscous black. Bill black, slate color, or slate black, but tip slate gray or white; cere slate black; lores yellow; iris canary yellow; bare portion of toes light brownish gray or cinereous, soles buff or pinkish white; claws slate gray or drab at base, becoming dull black at tips. *Adults, nuptial (light rufous phase):* Similar to dark rufous phase, but tawny and rufous portions replaced by ochraceous. *Adults, nuptial (dark gray phase):* Similar to dark rufous phase, but tawny and rufescent colors reduced to a minimum; grayish and blackish colors predominate. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter in corresponding phase. *First nuptial:* Acquired by wear from first winter. Similar to adults in corresponding phase, but ear-tufts somewhat smaller; entire plumage rather more rufous; white area on throat duller and not so large. *First winter (juvenal plumage of most authors):* Acquired by partial postjuvenal molt. Like first nuptial male and female. *Juvenal (second natal down of most authors):* Acquired by complete postnatal molt. Similar to nuptial adults, but upper and lower parts dull buff or ochraceous buff, numerously barred with fuscous or fuscous black; lower parts similar but with narrower, rather widely placed bars of fuscous or dark hair brown; edges of facial disks and some feathers about eye black. Maxilla blackish slate or slate gray, but base cinereous and tip white; mandible cinereous, but tip pale broccoli brown; cere pinkish white; iris gray to pale yellow; base of toes pinkish white; claws drab or slate gray. *Natal:* White, back and wings a little tinged with grayish buff.

MEASUREMENTS: *Adult male:* Wing, 320.0–355.1 (average, 343.2) mm.; tail, 190.0–210.1 (199.4); bill (culmen from cere), 25.9–29.9 (28.7); height of bill at base, 25.9–27.9 (27.2); tarsus, 60.5–72.9 (67.3); middle toe without claw, 41.9–52.1 (46.8). *Adult female:* Wing, 352.1–380.0 (366.3); tail, 199.9–225.1 (217.9); bill, 28.9–32.5 (30.5); height of bill, 26.4–32.0 (29.2); tarsus, 63.0–77.0 (70.4); middle toe, 45.0–56.9 (49.3).

RANGE: S.e. South Dakota to New Brunswick, south to s. Texas and s. Florida.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 1,100 ft. Collected north to Tarrant and Cooke (eggs), east to

Tyler (eggs), south to Cameron, west to Webb cos. Fairly common.

NESTING: *Nest:* In woods of hills or lowlands, in swampy forests, swamps or brush; sometimes high above ground, in nest of hawk or other bird or in hole in tree, even occasionally on ground or on rocks; made or lined with weed stems, cornstalks, bark strips, grass, bones, and feathers. *Eggs:* 1–5, usually 2–3; rounded oval or nearly spherical; shell thick and granular; dull white, unspotted; average size, 55.9 × 46.5 mm.

NORTHWESTERN GREAT HORNED OWL, *Bubo virginianus lagophonus* (Oberholser)

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. v. virginianus* but larger, except bill; ochraceous of upper parts and lower parts paler; face darker and more grayish (less ochraceous); dark barring of lower parts broader and more conspicuous, legs and feet much more heavily barred with fuscous. Similar to *B. v. pallescens* (see below), but larger and much darker throughout; legs and feet much more heavily barred as well as are under parts.

MEASUREMENTS: *Adult male:* Wing, 344.9–370.1 (average, 355.9) mm.; tail, 210.1–235.0 (223.5); bill (culmen from cere), 24.9–29.9 (27.2); height of bill at base, 23.9–25.9 (24.9); tarsus, 67.1–71.9 (69.6); middle toe without claw, 39.1–47.0 (41.7). *Adult female:* Wing, 350.0–400.0 (375.7); tail, 213.1–252.0 (238.5); bill, 25.9–31.0 (29.2); height of bill, 25.9–29.9 (27.7); tarsus, 67.1–73.9 (71.7); middle toe, 41.9–47.5 (44.7).

RANGE: Alaska and Yukon, south to c. Oregon and w. Montana. Casual in winter to Minnesota, Colorado, and Texas.

TEXAS: *Winter:* One record: Bexar Co., near San Antonio (bird taken alive, Nov. 9, 1934, identified by H. C. Oberholser; kept in San Antonio Zoo for considerable period thereafter).

MONTANA GREAT HORNED OWL, *Bubo virginianus occidentalis* Stone

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. v. pallescens* (see below), but considerably larger; colors averaging darker.

MEASUREMENTS: *Adult male:* Wing, 340.1–365.0 (average, 351.6) mm.; tail, 199.9–225.1 (212.9); bill (culmen from cere), 25.9–27.9 (27.2); height of bill at base, 24.9–28.9 (26.7); tarsus, 66.0–71.1 (69.3); middle toe without claw, 36.1–39.9 (37.8). *Adult female:* Wing, 359.9–390.1 (376.2); tail, 220.0–240.0 (230.6); bill (culmen from cere), 27.9–33.0 (30.2); height of bill, 25.4–29.9 (27.2); tarsus, 68.6–72.9 (70.9); middle toe, 35.6–42.4 (40.6).

RANGE: C. Alberta to n. Michigan, south to n.e. California and c. Kansas. Casual in winter to n. New Mexico, Oklahoma, Texas, and Iowa.

TEXAS: *Winter:* One specimen: Kerr Co., Ingram (Mar. 29, 1915, A. P. Smith).

WESTERN GREAT HORNED OWL, *Bubo virginianus pallescens* Stone

DESCRIPTION: *Adults, nuptial plumage:* Similar to *B. v. virginianus*, but tail longer; colors very much paler, tawny portions of plumage replaced by pale ochraceous, buff, or white; feathers of feet often immaculate white; face white or grayish with slight admixture of dull buff; under parts mostly white with mixture of buff or pale buff on breast, sides, and legs.

MEASUREMENTS: *Adult male:* Wing, 329.9–359.9 (average, 341.1) mm.; tail, 195.1–225.1 (215.9); bill (culmen from cere), 23.9–29.4 (27.2); height of bill as base, 23.9–27.4 (25.7); tarsus, 61.0–69.1 (65.8); middle toe without claw, 38.1–46.0 (41.9). *Adult female:* Wing, 355.1–374.9 (362.7); tail, 205.0–235.0 (222.0); bill, 25.9–31.0 (28.9); height of bill, 24.9–28.4 (26.2); tarsus, 62.0–71.1 (65.8); middle toe, 39.9–47.0 (43.7).

RANGE: S.e. California to c. Oklahoma, south to Nayarit and n. Nuevo León.

TEXAS: *Resident:* Altitudinal breeding range, 350 to 8,500

ft. Collected north to Wilbarger (eggs) and Wichita, east to Lee, south to Atascosa, west to Presidio and Hudspeth cos. Fairly common. *Winter:* Taken outside breeding range in Bee (1 specimen) and Cameron (3) cos.

NESTING: *Nest:* In mountains or lowlands, forests or open country; in hole of tree, old nest of other bird, cavity in cliff or bluff, or in cacti; otherwise similar to nest of *B. v. virginianus*. *Eggs:* 2–6, usually 2–3; shape and color like those of *B. v. virginianus*, but average size, 55.6 × 47.0 mm.

SNOWY OWL, *Nyctea scandiaca* (Linnaeus)

SPECIES ACCOUNT

A large, predominantly pure white, diurnal owl with round, hornless head and yellow eyes. A few old males are virtually immaculate, but most individuals are more or less spotted or irregularly barred (females more heavily so) with blackish, notably on top of head, back, and wings. Length, 23½ in.; wingspan, 5 ft.; weight, 4¾ lbs.

RANGE: Circumpolar on Arctic tundra. In winter, populations irregularly drift southward—often in mass movements—to s. Canada, extreme n. United States, British Isles, c. Europe, c. Russia, Turkistan, and n. China; in North America, very erratically—and in small numbers—south into s. United States.

TEXAS: *Winter:* Dec. to late Mar. Casual and highly erratic in northern Texas, south to San Antonio, Victoria, and Port Arthur. (See detailed account for specimen evidence.)

HAUNTS AND HABITS: The Snowy Owl ranges Arctic tundra around the world where it follows fluctuating supplies of Arctic hares, lemmings, ptarmigans, and other sources of meat. Its nest, typically constructed on a barren, dry, sometimes snow-drifted hillock on rolling tundra, is a barely scooped-out, sparsely lined hollow. Winter invasions of Snowy Owls into the United States vary in intensity and result from the massive rodent die-offs—due to stress and disease—that occur in the American Arctic on the average of every four years. When in the Midwest and South, the Snowy eats anything it can find—carriage, fish, even songbirds; the specimen from Archer County, Texas, contained a female Red-winged Blackbird. Only with the utmost rarity does a Snowy Owl reach as far south as Texas in its hunt for food; most “snowy owl” sightings in the state are based on Barn Owls which often appear ghostly white in car, flash, or floodlights.

Flying mostly by day, the Snowy is strong but deliberate and not particularly swift; its jerky flight is interspersed with glides. The bird does not generally perch in a tree, preferring instead the vantage of a rocky outcrop, bank, dune, hay stack, even the roof of a building, for prey watching.

The Snowy Owl’s rasping wheezes and harsh barks are rarely, if ever, heard on its visits to the United States.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by

wear from winter plumage. Entire plumage white, sometimes almost without markings, but upper parts, including head, wings, and end of tail, usually more or less spotted or irregularly barred with hair brown, drab, or chaetura black; markings on lower parts occur chiefly on abdomen, sides, and flanks. Bill black; cere dull neutral gray; iris golden yellow; claws black. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male but much more heavily marked, top of head streaked and spotted with chaetura black, remainder of upper parts, including wings, numerous and broadly barred with hair brown or fuscous, these bars narrowest on rump and upper tail-coverts; tail broadly barred with same, as are wing-quills, except on inner margins of inner webs which on inner secondaries are nearly all white; lower surface, except chin, throat, legs, and feet, broadly barred as is upper surface; lower tail-coverts narrowly and sparsely barred with hair brown. *Male and female, winter*: Acquired by complete post-nuptial molt. Practically identical with corresponding sex of nuptial adults. *Male, first nuptial*: Acquired by wear without molt from first winter. Similar to nuptial adult male but much more heavily barred both above and below, although less heavily so than in nuptial adult female; nape with dark area of heavily dark-barred feathers; tips of inner secondaries and tertials much mottled with brown or dull black. *Male, first winter* (juvenal plumage of most authors): Acquired by postjuvenal molt. Like first nuptial male. *Female, first nuptial*: Acquired by wear without molt from first winter. Similar to nuptial adult female, but much more heavily barred with black or dark brown both above and below; tips of inner secondaries and tertials much mottled with brown. Bill slate black; iris chrome yellow; claws blackish slate terminally, passing into smoke gray at base. *Female, first winter* (juvenal plumage of most authors): Acquired by postjuvenal molt. Like first nuptial female.

MEASUREMENTS: *Adult male*: Wing, 374.1–421.9 (average, 394.0) mm.; tail, 220.0–244.1 (230.4); bill (culmen from cere), 24.4–27.4 (25.7); height of bill at base, 20.6–23.9 (22.9); tarsus, 56.9–66.0 (59.7); middle toe without claw, 36.6–45.0 (40.1). *Adult female*: Wing, 405.1–465.1 (436.9); tail, 235.0–275.1 (254.0); bill, 25.9–27.9 (27.4); height of bill, 23.1–26.4 (24.6); tarsus, 56.9–69.1 (63.2); middle toe, 38.1–46.0 (41.7).

TEXAS: *Winter*: Five collections: Wichita Co. (?), vicinity of Wichita Falls (winter 1900; mounted bird in possession of Hal Mosley of Dallas); Archer Co., near Lake Wichita (male, Feb. 17, 1955, W. W. Dalquest; Midwestern University collection); Bexar Co., San Antonio (winter 1857, A. L. Heermann); Travis Co., Austin (winter 1876, S. B. Buckley); Jefferson Co., Port Arthur (ca. Mar. 31, 1936, fide Bessie Reid). Reported taken in Dallas Co. (1934, fide W. A. Mayer) and Newton Co., Deweyville (1 killed ca. 1910, Jack Mitchell), but details lacking or vague.

PYGMY OWL, *Glaucidium gnoma* Wagler

SPECIES ACCOUNT

Also known as Northern Pygmy Owl. Closely resembles Ferruginous Owl (see below), but grayer (less rufous) above, with blackish (not rusty) streaks below, the sides of breast brown spotted with whitish; pileum, hindneck, and back liberally dotted with dull white; slightly longer, dark brown tail with whitish bars. Length, 6¾ in.; wingspan, 12¾.

RANGE: S.e. Alaska, n. British Columbia, and w. Alberta, south through mountains of w. United States and Mexico (excluding n. Baja California) to highland Guatemala.

TEXAS: *Casual*: One specimen: El Paso Co., in a

gulch behind Homan's Sanatorium on eastern base of Franklin Mts., 6 mi. north of El Paso (Apr. 26, 1918, T. G. Wilder). Two additional records: Brewster Co., Boot Spring in Chisos Mts. (lone birds heard calling at dawn, Aug. 10, Sept. 28, 1969, R. H. Wauer).

HAUNTS AND HABITS: The Pygmy Owl is the highland version of the lowland Ferruginous Owl. The present species inhabits conifer and pine-oak forests in mountains of western North America where it seeks abandoned woodpecker holes in which to nest; it moves into meadows or other semiopen areas to hunt. For the most part it is a solitary bird.

Flight on unmuffled wings is fairly swift as the Pygmy moves through lower parts of the forest. Like a shrike, it advances in short flights, dropping from one perch to fly near the ground, then ascending to a new lookout. The bird generally pounces on its favored prey—small mammals, a variety of birds, reptiles (especially lizards), even large insects—from one of these vantages. Hawking is done in early morning and again in late afternoon; during the interim, it preens and dozes on a sunlit branch in a tree or bush. It probably roosts in tree cavities.

Apparently even more so than the Ferruginous, the Pygmy Owl is disliked by small woodland birds, and its presence draws an excited assortment of these forest-dwellers which band together in attempting to drive their enemy away. Imitating the Pygmy's whistle is an excellent way to attract a variety of species. In his numerous bird censuses within montane pine-oak forests of Arizona and northern Mexico, Joe T. Marshall, Jr., used his imitation of the Pygmy Owl call to determine how many birds were present, the sizes of their territories, etc. With considerable reason could it be said that this owl's hooting made possible Marshall's doctoral dissertation, subsequently published in 1957 by the Cooper Ornithological Society under the title *Birds of Pine-Oak Woodland in Southern Arizona and Adjacent Mexico*. Bird locators in the wonderful bird countries of Mexico and Guatemala are lucky: For best results they have only to imitate the Ferruginous Owl in the low country and the Pygmy Owl in the high sierra!

The Pygmy Owl's usual call is a mellow, whistled hoo, repeated every two seconds. Birders should not expect to hear the call in Texas.

DETAILED ACCOUNT: ONE SUBSPECIES

ROCKY MOUNTAIN PYGMY OWL, *Glaucidium gnoma pinicola* Nelson

Merged into *G. g. californicum* by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adults, nuptial plumage (gray phase)*: Acquired by wear from winter plumage. Upper parts hair brown to rather dark hair brown; pileum and hindneck numerous dotted with white, buffy white, or very pale buff; more or less well defined collar on hindneck made up of rather large dull white or buff spots; black patch on side of nape; remainder of upper surface more sparingly dotted with dull white; scapulars with large white spots, mostly on outer webs; tail dark hair brown or between hair brown and fuscous, with transverse opposite

spots of white or very pale buff on both webs giving impression of bars; wing-quills dark hair brown, primaries with small white spots on outer webs, larger spots on inner webs, and shadowy indications of obsolete bars of lighter brown; secondaries with smaller spots on outer webs and still larger spots on inner webs, these spots ranging from white to dull pale pinkish buff; tertiaries also dark hair brown, with rather large dull white or cream white spots on both webs; upper wing-coverts like back, but greater coverts with large white or buffy white terminal spots, median and lesser coverts sparingly dotted with white or buffy white; sides of head hair brown, dotted and very narrowly streaked with dull white and pale pinkish buff; lower parts white to cream white, well-defined collar on upper throat hair brown to dark hair brown; sides of breast almost solidly hair brown to dark hair brown, but with spots or markings of dull white or buff; remainder of lower surface broadly streaked with dark hair brown, chaetura drab, chaetura black, or brownish black, these streaks narrowest on under tail-coverts; lining of wing white or buff white, streaked and spotted with chaetura black. Bill and cere dull greenish yellow, but tip yellow; rictus greenish yellow; inside of mouth flesh color; iris lemon yellow; feet yellow or dull greenish yellow; soles of toes chrome yellow. *Adults, nuptial (ochraceous phase)*: Similar to gray phase, but upper parts more ochraceous, dark buffy brown, spots on cervix, as well as those on crown, cinnamon buff to clay color, other spots and light markings on upper surface more buffy; dark markings of lower parts more ochraceous—particularly those on sides of breast and of body and collar across throat all of which range from sepia to saccardo umber and olive brown, bars and spots also more decidedly ochraceous. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults, but spots on upper parts less conspicuous and somewhat more buffy, plumage more blended; lower parts with streaks less sharply defined. *First nuptial*: Acquired by wear from first winter. Similar to first winter male and female but somewhat lighter. *First winter* (juvenile plumage of most authors) *gray phase*: Acquired by complete postjuvenile molt. Pileum between mouse gray and hair brown, unmarked except for small white or buff markings on forehead; rather well defined collar of white spots on hindneck, with black bar on each side among white spots; remainder of upper parts between light olive brown and hair brown; wings, tail, and lower parts as in nuptial adults. Iris yellow. *First winter (ochraceous phase)*: Similar to gray phase of first winter male and female, but throughout much more rufescent, including markings on lower surface, wings, tail, and back, which last is between sepia and prout brown.

MEASUREMENTS: *Adult male*: Wing, 94.0–96.5 (average, 95.2) mm.; tail, 62.5–68.1 (64.3); bill (culmen from cere), 10.4–11.4 (10.7); height of bill at base, 9.4–10.4 (9.7); tarsus, 20.1–21.6 (20.9); middle toe without claw, 13.5–15.0 (14.5). *Adult female*: Wing, 98.1–104.9 (101.3); tail, 66.0–78.5 (71.7); bill, 10.4–11.9 (11.2); height of bill, 9.9–10.9 (10.4); tarsus, 20.1–22.1 (21.4); middle toe, 14.0–17.0 (15.7).

RANGE: C. British Columbia and s.w. Alberta, south (chiefly through Rockies) to s.e. California and s. New Mexico.

TEXAS: *Casual*: One specimen (see species account).

FERRUGINOUS OWL, *Glaucidium brasilianum* (Gmelin)

SPECIES ACCOUNT

Also known as Ferruginous Pygmy Owl and Streaked Pygmy Owl. A tiny, ear-tuftless, small-headed owl with yellow eyes; has a rather long tail which it often jerks and normally holds at an angle with its body. Largely rufous brown or olive brown above, top of head and hindneck (but not the back) finely streaked with dull white, lower hindneck with two

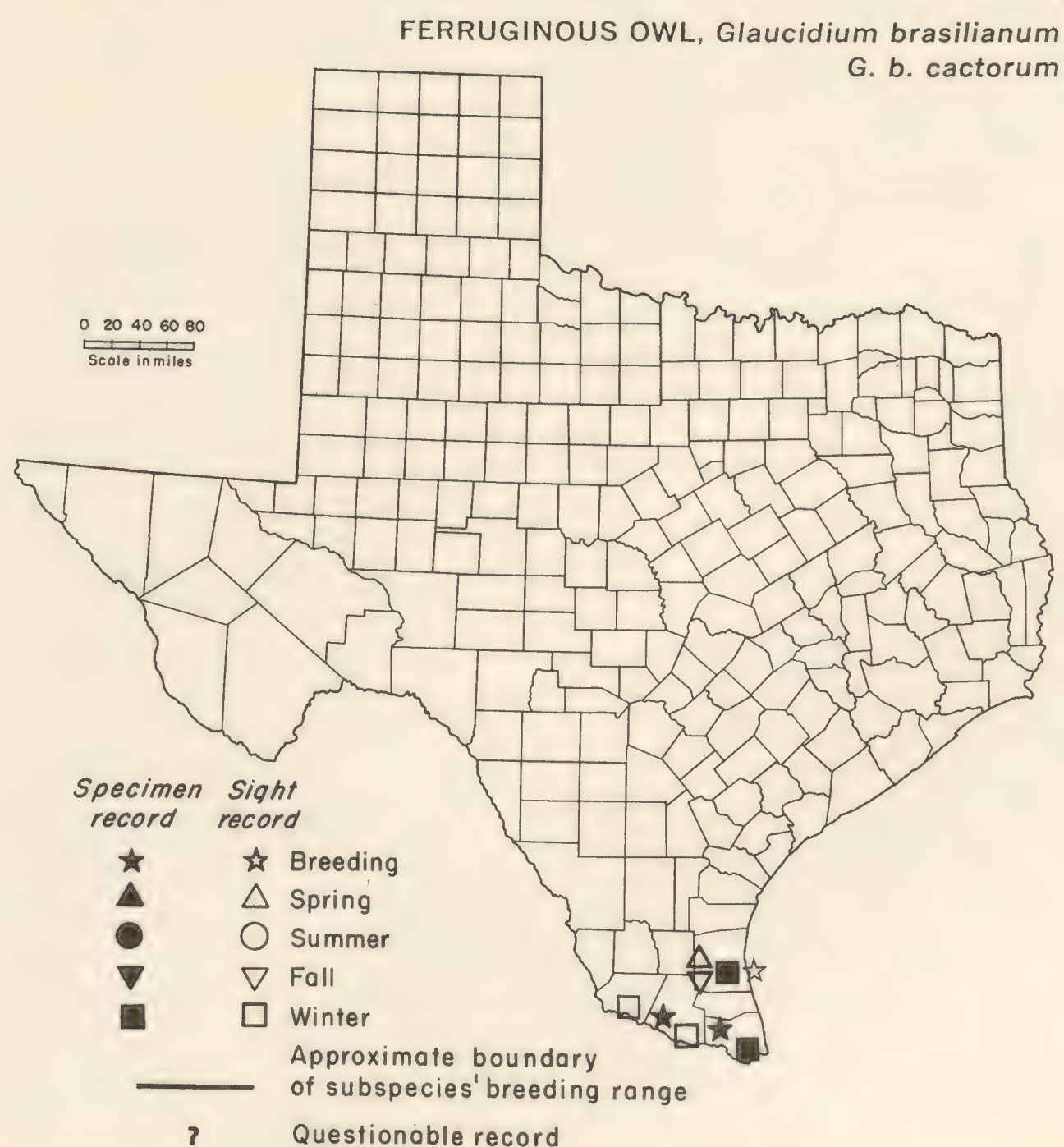
white-bordered black patches (suggest second pair of eyes); dull white below (including sides of breast) with bold rusty streaks on breast, sides, and flanks; tail variable—usually mainly rufous, faintly barred with blackish or mainly brown, narrowly barred with reddish. Length, 6¾ in.; wingspan, 14.

RANGE: S. Arizona and extreme s. Texas, south through lowlands of Mexico, Central America, and South America to Strait of Magellan.

TEXAS: (See map.) *Resident*: Breeds, early Apr. to late June (eggs, Apr. 9 to May 28) from near sea level to about 125 ft., possibly somewhat higher. Rare (formerly fairly common) in Rio Grande delta, chiefly along river from Falcon Dam, Starr Co. (breeding unconfirmed) to its mouth in Cameron Co. A small, apparently nesting, population recently discovered in Kenedy Co., King Ranch, Norias Division (Sept.–Dec., 1968, Mar.–Apr., 1969, B. A. Fall). One sighting in Val Verde Co., near mouth of Devils River (Jan. 28, 1950, Angus Cameron, J. Frank Dobie).

HAUNTS AND HABITS: Through lowlands of the continental American Tropics, the Ferruginous is usually the most numerous small owl. *Cuatro ojos* (four eyes, because of its two real eyes and two eyelike spots on the back of the head) as some Mexicans call this owl, frequents chiefly riparian trees, brush, palm, and mesquite thickets. Also during the day, it roosts in little caves and recesses on slopes of low hills.

The Ferruginous, like other members of its genus, hunts its prey—lizards, large insects, rodents, and birds (some as large as the owl)—both day and night. Flight is fairly noiseless, quick, and shrikelike. Often it lands in a rather exposed place; it frequently jerks its slender tail and may hold it at a crooked angle for some moments.



The sight or sound of this and other pygmy owls is enough to cause most small birds in the neighborhood to come heckle and mob the little predator. The Ferruginous is thus a tremendous boon to the bird finder in the Neotropics, world's richest bird region. By imitating this owl's measured toots or playing a tape recording of them, the birder is able to entice shy jungle brush and scrub birds out to where they can be seen, identified, and counted. Almost anybody who can whistle can create a good enough facsimile of these calls.

In daylight, twilight, and at night, the Ferruginous Owl utters, at the rate of two or three per second, a monotonous *took, took, took*, etc., that may, especially at night, go on with a few pauses for an hour or more. These notes are given from a perch; calls issue most of the year, but are much more frequent in spring and summer.

CHANGES: In Texas, the Ferruginous Owl is rare now (1972), but it was in fairly good numbers until 90 percent of the mesquite-ebony woodlands of the Rio Grande delta was cleared. Most clearing occurred between 1920 and 1945, but bulldozing continues.

The fate of the recently discovered colony in Kenedy County depends on present and future brush clearance programs of the King Ranch; as of late 1972, clearance operations were apparently accelerating on this ranch. A few of these little owls still cling to the remaining Rio Grande-side patches of mesquite, ebony, and cane in Starr and Hidalgo counties. However, they are considerably disturbed by hordes of bird watchers, some of whom keep their portable tape recorders hot for hours at a time in hopes that one of these rare birds will answer!

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN FERRUGINOUS OWL, *Glaucidium brasilianum cactorum* van Rossem

DESCRIPTION: *Adults, nuptial plumage (gray phase):* Acquired by wear from winter plumage. Upper parts hair brown to snuff brown, top of head and hindneck narrowly streaked and sometimes sparsely spotted with dull white; collar of white spots about hindneck; two white-bordered black patches ("eye-spots") on nape; tail hair brown, narrowly barred with tawny or cinnamon rufous; wing-quills hair brown, outer primaries with a few spots of white on outer webs and barred on both outer and inner webs with lighter brown, these bars becoming white on inner edge of inner webs on all but terminal parts of feathers, and on secondaries becoming white also on outer webs of feathers; scapulars and tertials spotted with white; wing-quills like back with a few spots of white; sides of head whitish, poorly indicated facial disks dull black at posterior edge on side of neck; lower parts dull white, broadly streaked with hair brown or fuscous on jugulum and posterior portions of body, except middle of breast and abdomen; chin and throat immaculate, upper part of throat somewhat streaked with hair brown; lining of wing mostly white with some streaks or spots of hair brown in middle; unfeathered parts as in rufous phase. *Adults, nuptial (rufous phase):* Upper surface nearly uniform cinnamon rufous or dull hazel, pileum more or less indistinctly streaked with paler, tail occasionally immaculate rufous but usually numerous-ly barred with fuscous; wing-quills russet to cinnamon rufous, barred with fuscous or hair brown, tips of primaries darker, outer webs of primaries with light cinnamon rufous spots, wing-

coverts, scapulars, and tertials with a few spots of white or buffy white; lower parts as in gray phase but dark streaks dull cinnamon rufous, sayal brown, or saccardo umber. Bill and cere dull light greenish yellow, grayish yellow, or yellowish olive, more yellowish at tip; iris lemon yellow; toes dull greenish yellow or grayish yellow; claws black. *Adults, nuptial (intermediate phase):* Similar to gray phase, but upper parts variously intermediate between two phases; upper tail-coverts and streaks on crown strongly tinged with cinnamon rufous. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults in corresponding phase. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adults in corresponding phase, but streaks on pileum very indistinct or absent. *Juvenal* (second natal down of most authors): Unknown. *Natal:* White to slightly buffy white.

MEASUREMENTS: *Adult male:* Wing, 85.1–90.4 (average, 87.9) mm.; tail, 58.9–65.5 (62.2); bill (culmen from cere), 9.4–11.9 (10.9); height of bill at base, 9.9–11.4 (10.4); tarsus, 19.0–22.1 (21.1); middle toe without claw, 15.5–18.8 (17.3). *Adult female:* Wing, 90.9–94.7 (91.7); tail, 63.5–69.6 (66.5); bill (culmen from cere), 10.4–13.0 (11.7); height of bill, 10.2–11.4 (10.7); tarsus, 20.3–24.4 (22.4); middle toe, 16.5–19.0 (17.8).

RANGE: S. Arizona and extreme s. Texas, south to s. Guerrero, Nuevo León, and Tamaulipas.

TEXAS: *Resident:* Collected in Hidalgo and Cameron cos. (many eggs and skins, chiefly from Brownsville vicinity). One specimen from Kenedy Co.: King Ranch, Norias Division, 6 mi. east of Rudolf (1 male, Dec. 6, 1968, B. A. Fall; Texas A&M University collection, no. 7770).

NESTING: *Nest:* In woods, brush, and timber, often in river valleys; in hole in tree, usually low, but sometimes 40 ft. up; occasionally in abandoned hole of woodpecker; lined, if at all, with a few leaves of plants. *Eggs:* 2–5, usually 3 or 4; oval or spherical; granular, a little glossy; white, unmarked; average size, 27.2 × 23.4 mm.

ELF OWL, *Micropallas whitneyi* (Cooper)

SPECIES ACCOUNT

Micrathene whitneyi of A.O.U. check-list, 1957 (see Appendix A). A tiny, ear-tuftless, round-headed owl with yellow eyes and a stub tail. Buff-mottled grayish brown above with an irregular white collar across hindneck, and white wing-spots; largely whitish below, indistinctly blotched with tawny; incomplete buffy facial disks bordered above by white brows. Length, 5¾ in.; wingspan, 15.

RANGE: S.e. California to Trans-Pecos and extreme s. Texas, south to c. highland Mexico; also s. Baja California and Socorro Island. Winters in Mexico.

TEXAS: (See map.) *Breeding:* Summers from Mar. 12 to Sept., but actual nesting records scarce (female captured at nest, Brewster Co., Burnham Ranch, Government Spring, May 21, 1934, R. W. Quillin; bird seen at hole in juniper, Big Bend Nat. Park, June 4, 1965, Ruth Black, Rose Ann Rowlett, J. D. Scurlock; young bird photographed, Hidalgo Co., Bentsen-Rio Grande Valley State Park, 1959, Mr. and Mrs. Luhe McConnell, P. B. Myers; 2 young raised, adult and 1 young photographed in same park, 1961, Allan Hayse, Pauline James; nesting strongly suspected at two nearby locations, Hidalgo Co., 1961, Hayse, James; adult and 1 young observed at 2 sites in Santa Ana Nat. Wildlife Refuge, July–Aug., 1965, R. J. Fleetwood). Fairly com-



PLATE 15: Red-headed Woodpecker, *Melanerpes erythrocephalus*
young (left), adult (upper right)

mon in Brewster Co.; uncommon in Davis Mts. (nesting suspected); probably rare in Guadalupe Mts. (2–3 pairs observed, 1969, F. R. Gehlbach); scarce to rare in Rio Grande delta, chiefly Hidalgo Co.

HAUNTS AND HABITS: The Elf Owl, probably the smallest of its family, is often described as a sparrow-sized owl, but it is actually a bit larger bodied and much bigger headed than any sparrow; nonetheless it registers with human observers as tiny and cute. This owl is at home in various U.S.-Mexico border habitats: agave-ocotillo-cactus desert scrub, riverside cottonwood-willow groves, mesquite woods on floodplains, and juniper-pinyon-pine-oak woodlands on semiarid mountains. Apparently the bird avoids solid stands of pines, but almost every other type of dry woody vegetation suits it. In Texas it inhabits chiefly the Big Bend region since here are located all its favored aridland plants, except its Arizona favorite, the saguaro or giant tree cactus (*Cereus giganteus*).

The Elf spends the daytime roosting inside a woodpecker hole or natural cavity in a giant cactus, agave bloom stalk, or tree trunk. When dusk comes, it wakes up and flies out into its hunting territory. Sometimes an individual flits silently about a camp fire where it hawks insects drawn to the glow. The species feeds hugely on moths (especially hawk moths), crickets, roaches, grasshoppers, beetles, and other insects and their larvae which it catches on the wing or snatches off foliage or the ground. Within its feeding territory, the bird moves quickly through a series of perches on low, dead branches which overlook bare earth or rock; from these lookouts this tiny owl pounces on scorpions in addition to the more usual large insects.

Elf vocalizations include a *churp* note and a rapid, high-pitched, excited *whi-whi-whi-whi-whi-whi* or *chewk-chewk-chewk-chewk*, etc. Pairs often utter pup-

pylike yips, yaps, barks, and whines in a loose duet. This astonishingly loud owl is most vocal in early evening, on moonlit nights, and at daybreak from spring into June.

DETAILED ACCOUNT: TWO SUBSPECIES

WHITNEY'S ELF OWL, *Micropallas whitneyi whitneyi* (Cooper)

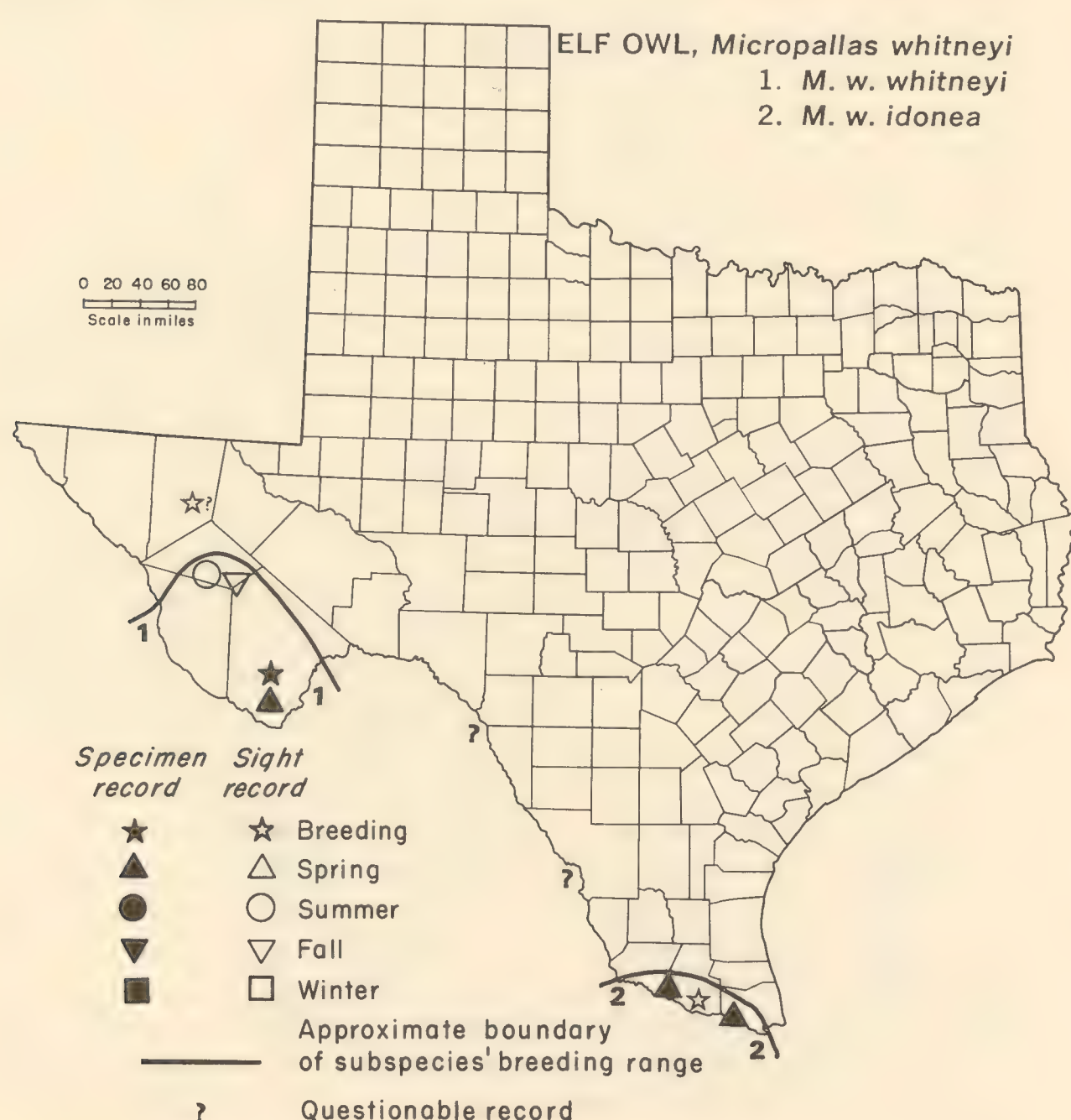
DESCRIPTION: *Adults, nuptial plumage (gray—normal—phase):* Acquired by wear from winter plumage. Upper parts hair brown or rufescent hair brown, forehead and crown thickly spotted or somewhat streaked, remainder of upper surface with small spots of buff to dull tawny; irregular collar on hind-neck and stripe on each side of back formed by outer webs of scapulars white; scapulars barred terminally with buff or dull tawny; wings and tail dark drab, tail with spots or imperfect bars of buff or on inner webs with white; outer webs of primaries and secondaries barred or spotted with buffy white, buff, ochraceous tawny, or tawny, inner webs of primaries and secondaries barred or spotted basally with white or buff; wing-coverts much like back, lesser series spotted or tipped with buffy white, middle and greater series with large terminal spots of white and spotted on outer webs with buff or tawny, many lesser coverts barred terminally with dull pale buff or tawny; facial disks ochraceous buff or tawny; superciliary stripe white; chin and throat buffy ochraceous, orange, or tawny, chin pale; jugulum grayish white, barred with fuscous and ochraceous; remainder of lower parts white or dull white, somewhat barred or spotted obscurely with hair brown and much blotched with tawny, cinnamon, or ochraceous tawny; crissum white with a few streaks of hair brown on longer feathers; thighs buff or ochraceous tawny, spotted or barred with fuscous or hair brown; lining of wing white spotted with hair brown. Bill light brown, cutting edges of mandibles yellowish; iris lemon yellow; toes dull brown. *Adults, nuptial (brown phase):* Similar to gray phase, but general color of upper parts very much more brownish and with ochraceous markings on wings more conspicuous; anterior lower parts more extensively suffused or spotted with ochraceous to ochraceous tawny or tawny. *Adults, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter in corresponding phase. *First nuptial:* Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by complete postjuvenal molt. Similar to adults in winter, but pileum almost unspotted hair brown; remainder of upper surface hair brown with obscure bars, instead of spots, of dull cinnamon or buff and bars on rump and upper tail-coverts of dull white; lower surface white, mottled anteriorly with hair brown and posteriorly barred irregularly with same color; crissum nearly immaculate. Toes without buff or ochraceous, but dull hair brown, somewhat mixed with white. *Juvenal* (second natal down of most authors): Unknown. *Natal:* Grayish white or cream white.

MEASUREMENTS: *Adult male:* Wing, 105.9–114.6 (average, 109.2) mm.; tail, 48.0–52.6 (50.3); bill (culmen from cere), 8.6–9.9 (9.1); height of bill at base, 8.1–9.4 (8.6); tarsus, 22.1–23.4 (22.6); middle toe without claw, 13.5–15.5 (14.5). *Adult female:* Wing, 104.1–110.5 (106.1); tail, 45.5–52.1 (48.3); bill, 8.6–9.9 (9.1); height of bill, 8.4–9.9 (9.1); tarsus, 21.1–24.4 (22.9); middle toe, 14.0–16.0 (15.0).

RANGE: S.e. California to s.w. New Mexico, south to Sonora and Trans-Pecos Texas.

TEXAS: *Resident:* Altitudinal breeding range, about 2,000 to 5,700 ft. One specimen: Brewster Co., Chisos Mts., Basin, 5,300 ft. (Apr. 28, 1935, G. M. Sutton). Fairly common locally.

NESTING: *Nest:* On mesas, desert slopes, or in canyons; often in deserted woodpecker hole in tree (such as cottonwood and mesquite) or in agave bloom stalk, most commonly in giant cactus (Arizona and Sonora), often in stump of tree, up to 20 or more ft. above ground; only nest material is a few dry chips at



bottom of nesting cavity. *Eggs*: 2–5, usually 3, oval to subspherical; slightly glossy; white, unmarked; average size, 26.7×23.4 mm.

TEXAS ELF OWL, *Micropallas whitneyi idonea* Ridgway

DESCRIPTION: *Adult*, *nuptial plumage (gray phase)*: Similar to *M. w. whitneyi*, but upper parts more grayish; less cinnamon buff and rufescent brown on lower surface. Upper parts between mouse gray and hair brown, pileum and hindneck peppered with dull pale buff; collar of rather large white or buffy white spots around hindneck; a few large white spots on outer webs of some scapular feathers; back and remainder of upper surface dotted like crown; tail light hair brown with narrow imperfect bars of dull white or pale buff; wing-quills hair brown, outer webs spotted with white or pinkish buff, inner webs spotted basally or for most of length with white; lesser wing-coverts with edgings of pinkish buff and conspicuous spots of white; face hair brown, much mixed with white and with conspicuous white superciliary stripe; posterior portion of facial disk below eye pure white, edges dull black mixed with white and cinnamon, posteriorly very sparsely mottled or spotted with hair brown; crissum white; lining of wing white, spotted and barred with hair brown. Bill pale dull greenish; iris lemon yellow; toes dull yellowish.

MEASUREMENTS: *Adult male* (probably): Wing, 108.5–110.5 (average, 109.5) mm.; tail, 49.5–50.0 (49.8); bill (culmen from cere), 8.4–8.9 (8.6).

RANGE: Extreme s. Texas, south to Guanajuato and Puebla.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to about 125 ft. Four specimens: Hidalgo Co., Hidalgo (Apr. 4, 5, 13, 1889, F. B. Armstrong); Cameron Co., Brownsville (Mar. 14, 1894, F. B. Armstrong). Scarce and local.

NESTING: Similar to that of *M. w. whitneyi*, but in some localities nests at lower altitudes.

BURROWING OWL, *Speotyto cunicularia* (Molina)

SPECIES ACCOUNT

A small, ear-tuftless, very long-legged, terrestrial owl with yellow eyes and a stub tail. White-spotted brown upper parts and breast; whitish upper throat and jugulum separated by blackish collar; buffy white posterior under parts barred with brown; whitish facial disks finely streaked with brown. Length, $9\frac{1}{4}$ in.; wingspan, $24\frac{1}{2}$; weight, $6\frac{1}{4}$ oz.

RANGE: S. British Columbia to s. Manitoba, south through w. United States and Mexico (including many offshore islands), and locally through Central America (possibly breeds) and South America to Tierra del Fuego; resident in c. and s. Florida and West Indies (locally). Migratory in the north, wintering chiefly from California, Arizona, Texas, and Louisiana to Guatemala.

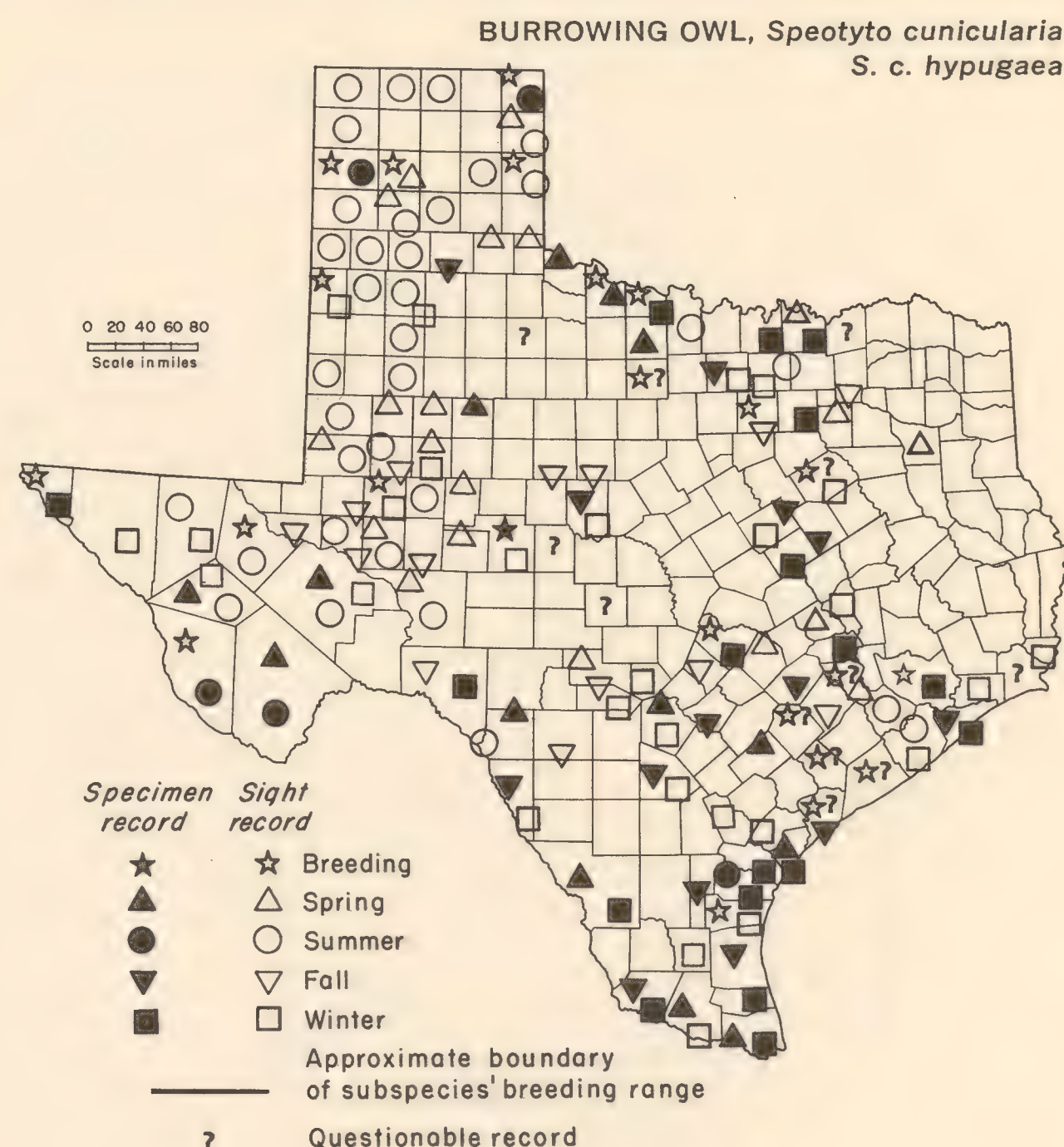
TEXAS: (See map.) *Breeding*: Early Apr. to late July (eggs, Apr. 13 to May 18; young nearly fledged, July 21) from near sea level to 5,100 ft. Common to uncommon on plains of western half south to 30th parallel; rare and highly irregular in remainder of western half, and east locally to Fort Worth, Corsicana (nesting unconfirmed), Austin (at least formerly), and coastal plain from Houston to Kleberg Co. *Winter*: Late Sept. or early Oct. to mid-Apr. (extremes: Aug. 6, May 27). Locally fairly common to uncommon in middle and southern Panhandle (usually withdraws from northern

Panhandle); scarce to rare and decidedly local through remainder of western three-quarters and on upper coast; apparently accidental near Tyler (Apr., 1963).

HAUNTS AND HABITS: The Burrowing Owl, a most remarkable long-legged, ground-haunting owl, seeks expanses of treeless, short-grass plains and prairies ideally unbroken by cultivation. A characteristic habitat is a prairiedog town where it finds ready-made nest cavities in abandoned holes. Often in daylight the bird—appearing quite ludicrous to human observers—stands by its burrow entrance, bowing and turning its head from side to side. Certainly no owl of western Texas plains and deserts is quite so conspicuous. Although the species shows a preference for prairiedog holes, it nests in vacated spermophile holes (which the owl must enlarge) and burrows of rabbits, armadillos, badgers, skunks, foxes, and coyotes. Burrowing Owls often nest in loose colonies—especially where there is a high density of prairiedog burrows—but the birds are seen also singly or in pairs.

The noiseless flight is rather labored and usually not long sustained. The bird remains, for the most part, close to the ground, making only short flights at low elevations from one point to another. Hunting from early evening into the night and less frequently during the day, the Burrowing eats a large quantity of insects, especially grasshoppers, locusts, and beetles, in addition to mice, rats, ground squirrels, and occasionally a young prairiedog or small bird.

One call, apparently used as an alarm note, is a chattering or chuckling *quick-quick-quick* (also described as *cack-cack-cack*) often given on the wing. The evening call of the Burrowing Owl is a far-reaching, mellow *coo-co-hoo coo-hoo*, in quality like that of



a Mourning Dove except higher pitched. This owl is vocal chiefly in and near the breeding season.

CHANGES: During the nineteenth century, the Burrowing Owl and black-footed ferret seemed absolutely dependent on the great prairiedog towns of the Great Plains, but the large colonies of these barking marmots are no more. When settlers and U.S. Government agents arrived, they poisoned and shot millions of prairiedogs. The ferret, which relied on these fat rodents for food, was brought to extinction's door. However, the owl—not as dependent on the prairiedog—survived in only somewhat reduced numbers. After the big colonies were gone, the Burrowing Owl, at least in Texas, switched to armadillo and rabbit holes. But many gunners also have switched from prairiedogs to Burrowing Owls to maintain their marksmanship. It is most remarkable that some Burrowing Owls—and even a few prairiedogs—survive. One of the easiest places to see the two species living together somewhat as they did in the old days is in Mackenzie State Park in Lubbock. In this park the proportion of owls to dogs is higher than it was in a pristine colony, but here, at least, is a living, breathing, uncaged sample.

DETAILED ACCOUNT: ONE SUBSPECIES

WESTERN BURROWING OWL, *Speotyto cunicularia hypugaea* (Bonaparte)

DESCRIPTION: *Adults, nuptial plumage (light—normal—phase):* Acquired by wear from winter plumage. Upper parts buffy brown or saccardo umber, spotted with pale buff, buffy white, and white, these markings forming more or less evident collar on hindneck, markings smallest on crown and largest on scapulars and wing-coverts, most obscure on rump; upper tail-coverts and tail similar, but rather more buffy brown and with several bars of white, buffy white, or pale buff; wing-quills same, darker at tips and spotted or barred on both webs with white, buffy white, or pale buff; face white or buffy white, more or less streaked with pale buff, and edges of facial disks clove brown or fuscous black on sides of neck, forming fairly well defined collar across throat; chin and jugulum white; upper throat buff, streaked with clove brown; remainder of lower parts white, buffy white, or pale buff; breast brown like back but spotted with buff or white; posteriorly to this the lower surface broadly barred with buffy brown or saccardo umber, except abdomen and crissum which are immaculate; lining of wing buff or pale buff. Bill dull greenish yellow, yellowish olive buff, or greenish blue, rather darker at base, and sometimes cream color at tip and olive gray at base; cere olive gray or dull black; iris canary yellow or lemon yellow; toes and naked part of legs dull broccoli brown or brownish green; claws dull black. *Adults, nuptial (dark phase):* Similar to light phase, but upper parts and breast very much darker sepia or olive brown. *Adult, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults in corresponding phase, but plumage somewhat more blended. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by wear from first winter. Practically identical with nuptial adults in corresponding phase. *First winter (juvenal plumage of most authors):* Acquired by partial postjuvenal molt. Similar to first nuptial male and female. *Juvenal (second natal down of most authors):* Acquired by complete postnatal molt. Upper parts light grayish brown to buffy brown, sometimes with a few spots of buffy white; most of wing-coverts buff with few or no dark markings; lower parts and upper tail-coverts pale buff; band of olive brown and buff across throat and breast more or less clouded with buff or buffy brown; otherwise like adults. *Natal:* Grayish white.

MEASUREMENTS: *Adult male:* Wing, 164.6–178.1 (average,

172.2) mm.; tail, 74.4–86.1 (81.8); bill (culmen from cere), 13.0–15.0 (14.2); height of bill at base, 12.4–13.0 (12.7); tarsus, 41.4–48.5 (45.2); middle toe without claw, 19.0–22.1 (20.3). *Adult female:* Wing, 162.6–181.1 (170.2); tail, 71.7–85.6 (79.0); bill, 13.0–15.0 (13.7); height of bill, 11.9–13.5 (12.4); tarsus, 39.9–46.5 (42.9); middle toe, 18.0–20.6 (19.6).

RANGE: S. British Columbia, Saskatchewan, and s. Manitoba, south to Baja California and w. and c. Mexico (exact southern limits of breeding range unknown); also many coastal islands off Baja California, Guadalupe Island, and islands in Revilla Gigedo group. Winters from n. California, Arizona, Texas, and Gulf coast (irregular inland and east of Louisiana) through Mexico to Guatemala, casually to Panama.

TEXAS: *Breeding:* Collected north to Oldham and Lipscomb, east to Archer and Harris (Jan. 31), south to Nueces, west to Presidio and El Paso cos. *Winter:* Taken north to Wichita, east to Grayson and Galveston, south to Cameron, west to Webb, Val Verde, and El Paso cos.

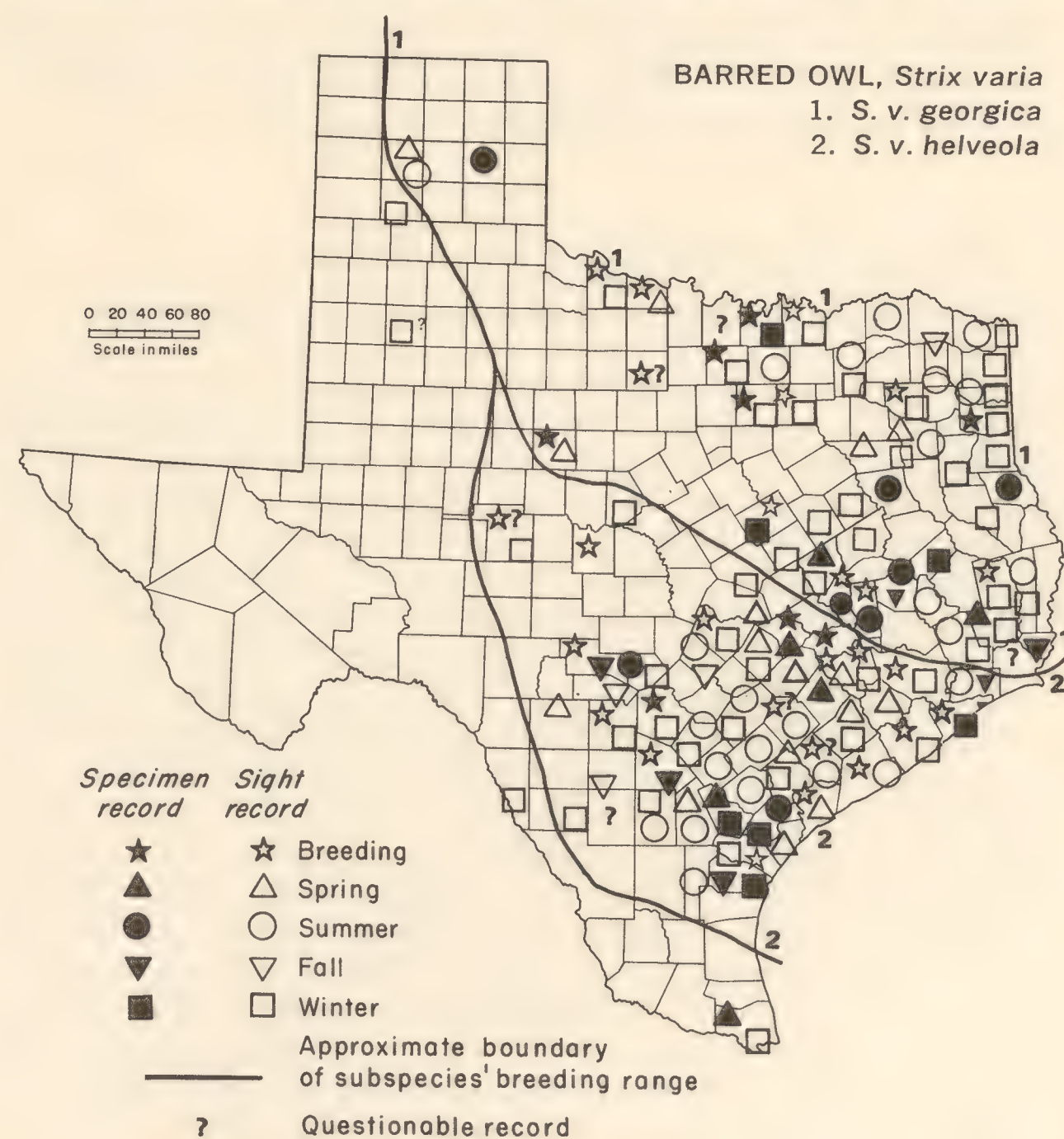
NESTING: *Nest:* On prairies, plains, and stony mesas; usually in an old mammal burrow in ground; sometimes 10 ft. long, terminating in a chamber; made of bits of dry animal dung, grass, weed stalks, and feathers; lined with grass, a few feathers, weed stalks, bits of skin, and rubbish. *Eggs:* 4–12, usually 6–8; usually rounded ovate, sometimes almost pyriform; usually rather smooth, even slightly glossy; white, unspotted; average size, 31.0 × 25.4 mm.

BARRED OWL, *Strix varia* Barton

SPECIES ACCOUNT

A large, round-headed, hornless owl with enormous blackish eyes and a yellowish bill. Grayish brown above, liberally barred—the wings also spotted—with white; mainly whitish below with numerous brown bars across breast and bold brown stripes down belly, sides, and flanks; grayish facial disks lined with narrow brown concentric rings. Length, 20¼ in.; wing-span, 3¾ ft.; weight (*S. v. varia*), 1¾ lbs.

RANGE: S. Canada, south, east of Rockies, to c. Texas



and Gulf coast; also c. highland Mexico from Durango to Oaxaca and Veracruz.

TEXAS: (See map.) *Resident*: Breeds, late Jan. to late June (eggs, Feb. 2 to June 4) from near sea level to 3,600 ft. Common to uncommon in most of wooded eastern half west to Vernon, Fort Worth, Waco, Austin, San Antonio, and Beeville, and in northern Panhandle (exceedingly local); scarce to rare west locally to Abilene, San Angelo, Kerrville, and Atascosa Co.; rare south to Alice and Corpus Christi. Casual visitor (nonbreeders) west to Lubbock and Eagle Pass, south to Brownsville.

HAUNTS AND HABITS: In Texas, as elsewhere, the Barred Owl lives in deep riverbottom woods and swamps; at twilight it moves into more open country to hunt. The species is not gregarious.

Flight is strong, silent, and buoyant as the bird easily sails through even dense forests. It is not particularly swift and has rather small, weak feet for a raptor. Preying chiefly on mice, small mammals, frogs, crayfish, and birds, the Barred depends on a quiet, stealthy approach and a quick pounce on its victim. Day is usually spent roosting high in a tree. When a person approaches the base of its daytime perch, the bird often peers calmly—and blinkingly—down at the intruder without taking flight. What a contrast with the Great Horned Owl's habit of dashing away at high speed, even on the sunniest of days, when the hiker is still sixty or more yards distant!

The Barred Owl is one of the noisiest of owls and its call is one of the strangest, most startling of woodland sounds. Eight rhythmic hoots in two groups of four are usually uttered: *hoohoo-hoohoo hoohoo-hoohooaw* (closing *aw* is typical). This hooting has also been rendered as *Who cooks for you, who cooks for you-all?* (the end drawled Southern style). It also utters a variety of chuckles, grunts, and laughs. The Barred Owl is heard in the eastern half of Texas all through the year, but especially in winter and spring.

DETAILED ACCOUNT: THREE SUBSPECIES

NORTHERN BARRED OWL, *Strix varia varia* Barton

DESCRIPTION: *Adults, nuptial plumage (gray—normal—phase)*: Acquired by wear from winter plumage. Upper parts including wings and tail olive brown, somewhat darker on head, everywhere broadly barred with white, buffy white, or very pale buff; wing-coverts with large spots of white; tail with several bars of white, buffy white, or drab, tip brownish white; bars on wing-quills, at least at outer edge, drab or light hair brown, which on outer webs of feathers become white; facial disk grayish white or buffy white, mixed with olive brown, often in form of concentric narrow bars, and edge of facial disk dark olive brown or clove brown; chin white or buffy white; upper throat much streaked or spotted with olive brown or clove brown; throat white or grayish white, somewhat spotted with fuscous, sometimes almost immaculate; breast white or buffy white, broadly barred with olive brown or hair brown; abdomen, sides, and flanks white or buffy white, broadly streaked with olive brown; crissum pale buff or buffy white, some feathers with terminal shaft streaks of fuscous or olive brown; feathers of legs and feet the same, somewhat flecked or obscurely barred with olive brown; middle of abdomen sometimes unmarked; lining of

wing white or buffy white, somewhat spotted with hair brown. Bill pea green, shading into dull chrome yellow at tip; cere pea green; iris dark brown or brownish black; unfeathered portion of toes olive yellow or wax yellow; claws dull brown at base, dull black terminally. *Adults, nuptial (ochraceous phase)*: Similar to gray phase, but ground color of upper parts bister or warm sepia, light bars ochraceous, ochraceous tawny, cinnamon buff, or clay color; posterior lower parts much more strongly ochraceous. *Adults, winter*: Acquired by complete postnuptial molt. Similar to nuptial adults in corresponding phase. *Second winter*: Acquired by complete postnuptial molt. Like corresponding phase of adults in winter. *First nuptial*: Acquired by wear from first winter. Practically identical with nuptial adults in corresponding phase. *First winter* (juvenal plumage of most authors): Acquired by partial postjuvenal molt. Similar to first nuptial male and female in corresponding phase, but upper parts more brownish, light bars on hindneck buff instead of white; light bars of wings and tail suffused with buff; lower surface more buffy. Bill maize yellow; tongue white; iris black or prout brown; upper surface of toes sulphur yellow or straw yellow; soles of toes maize yellow or straw yellow; claws black. *Juvenal* (second natal down of most authors): Acquired by complete postnatal molt. Head, neck, and entire under surface broadly barred with olive brown and white or pale buff, bars narrowest on pileum; remainder of upper surface including wing-coverts similarly barred, but very much more broadly, and each feather widely tipped with white; wing-quills and tail feathers as in nuptial adults. *Natal* (this plumage of this race not seen in Texas): Pure white.

MEASUREMENTS: *Adult male*: Wing, 320.0–340.1 (average, 332.7) mm.; tail, 215.1–230.1 (225.3); bill (culmen from cere), 23.6–26.9 (25.1); height of bill at base, 21.1–23.9 (22.4); tarsus, 57.9–64.0 (61.2); middle toe without claw, 33.0–38.1 (35.8). *Adult female*: Wing, 329.9–352.1 (338.3); tail, 224.1–237.0 (230.4); bill, 25.4–29.9 (27.7); height of bill, 21.1–24.9 (22.9); tarsus, 58.4–66.0 (61.5); middle toe, 37.1–40.4 (38.9).

RANGE: C. Montana to Newfoundland, south to n.w. Oklahoma and n. Georgia; in winter casually to Texas, s. Louisiana, and n.w. South Carolina.

TEXAS: *Winter*: Two specimens: Cooke Co., near Gainesville (Feb. 4, 1885, G. H. Ragsdale); Orange Co. (Nov. 4, 1887, F. B. Armstrong).

NESTING: (This race does not nest in Texas.) *Nest*: In forests or wooded swamps, even in cultivated areas; in old nest of hawk or crow or in natural hollow of tree, usually high above ground; made of leaves, rubbish, and if in cavity, of bits of decayed wood, sometimes lined with feathers. *Eggs*: 1–4, usually 2; oval to short rounded oval, occasionally ovate; pure white; unmarked; average size, 49.5 × 42.4 mm.

FLORIDA BARRED OWL, *Strix varia georgica* Latham

DESCRIPTION: *Adults, nuptial plumage*: Like *S. v. varia*, but toes unfeathered except for narrow strip on outer side of middle toe. *Natal*: Probably similar to *S. v. varia*.

MEASUREMENTS: *Adult male*: Wing, 315.0–340.1 (average, 326.7) mm.; tail, 205.0–231.1 (220.2); bill (culmen from cere), 23.1–27.9 (24.6); height of bill at base, 21.1–23.1 (22.4); tarsus, 57.9–61.0 (59.7); middle toe without claw, 32.5–38.6 (35.3). *Adult female*: Wing, 329.9–360.0 (347.2); tail, 215.1–245.1 (232.1); bill, 24.9–27.9 (28.4); height of bill, 22.6–24.4 (23.4); tarsus, 57.9–63.5 (61.2); middle toe, 36.1–39.9 (37.8).

RANGE: S.e. Kansas and s. Illinois to n.e. North Carolina, south to s.e. Texas and c. Florida.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 3,600 ft. Collected northwest to Gray, east to Harrison (eggs) and Shelby, south to Hardin, west to Brazos and Taylor (eggs) cos. Fairly common. Two specimens taken outside breeding range: Galveston Co., High Island (Nov. 28, 29, 1916, A. P. Smith).

NESTING: *Nest*: Similar to that of *S. v. varia*. *Eggs*: 1–4, usually 2; oval or short rounded oval, occasionally ovate; pure white, unmarked; average size, 51.1 × 42.7 mm.

TEXAS BARRED OWL, *Strix varia helveola* (Bangs)

DESCRIPTION: *Adults, nuptial plumage:* Colors similar to those of *S. v. georgica*, but upper parts paler and more strikingly barred, and bars more nearly pure white; bars on tail feathers broader and more whitish; dark stripes on posterior lower surface narrower and paler; legs of paler buff and usually much less mottled, sometimes unmarked; general appearance of lower parts more whitish. Bill and feet larger. *Natal:* Probably similar to *S. v. varia*.

MEASUREMENTS: *Adult male:* Wing, 310.9–344.9 (average, 327.7) mm.; tail, 213.1–238.0 (223.0); bill (culmen from cere), 23.1–27.9 (25.4); height of bill at base, 21.6–24.9 (23.4); tarsus, 57.9–67.1 (63.5); middle toe without claw, 32.0–38.1 (34.8). *Adult female:* Wing, 327.9–355.1 (338.3); tail, 215.1–254.0 (225.3); bill, 24.4–29.4 (26.9); height of bill, 22.6–25.9 (24.1); tarsus, 58.9–71.1 (65.8); middle toe, 35.1–39.9 (36.8).

RANGE: S. central Texas.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 1,900 ft. Collected north to Lee, east to Chambers, south to Nueces, west to Kerr cos. Fairly common. Three specimens taken outside breeding range: Walker Co., Trinity River, 17 mi. southwest of Trinity (Nov. 14, 1936, P. D. Goodrum); Cameron Co., Brownsville (May 2, 11, 1900, F. B. Armstrong).

NESTING: Similar to that of *S. v. georgica*, but average egg size, 48.5 × 41.4 mm.

SPOTTED OWL, *Strix occidentalis* (Xantus)

SPECIES ACCOUNT

Closely resembles the somewhat larger Barred Owl, but plumage browner (less gray) with numerous white spots above and below; posterior under parts short-barred horizontally—rather than long-streaked vertically—with brown. Length, 17½ in.; wingspan, 3½ ft.

RANGE: S.W. British Columbia to mountains of s. California, and from Arizona and Colorado, south in mountains of New Mexico, n. Trans-Pecos Texas, and n. Mexico to Michoacán.

TEXAS: (See map.) *Resident:* Breeding very likely (fide F. R. Gehlbach), but actual evidence lacking. Scarce in Guadalupe Mts., where recorded from about 7,000 to 8,500 ft. Usually one pair occupied McKittrick Canyon from 1938 (T. D. Burleigh and G. H. Lowery) through 1969 (Gehlbach); possibly a pair inhabited The Bowl in 1969 (Gehlbach and G. A. Newman).

HAUNTS AND HABITS: On the Spotted Owl, spots replace the streaks and bars of its eastern relative, the Barred. Within their separate U.S. ranges each is the largest brown-eyed, ear-tuftless owl. In coniferous timber—commonly pines and Douglasfir—of mountains, it lives chiefly in remote, shady canyons, where during the day it roosts in the dense shadow of a tree, rocky gully, or cave. Like most other owls, it is usually seen singly or in pairs.

The noiseless flight, similar to that of the Barred, is strong although not especially rapid. Apparently not at all shy or suspicious, it is one of the most easily approached of the large owls. At night the bird hunts rats (especially wood rats), mice, other small rodents; also insects and, very occasionally, small birds.

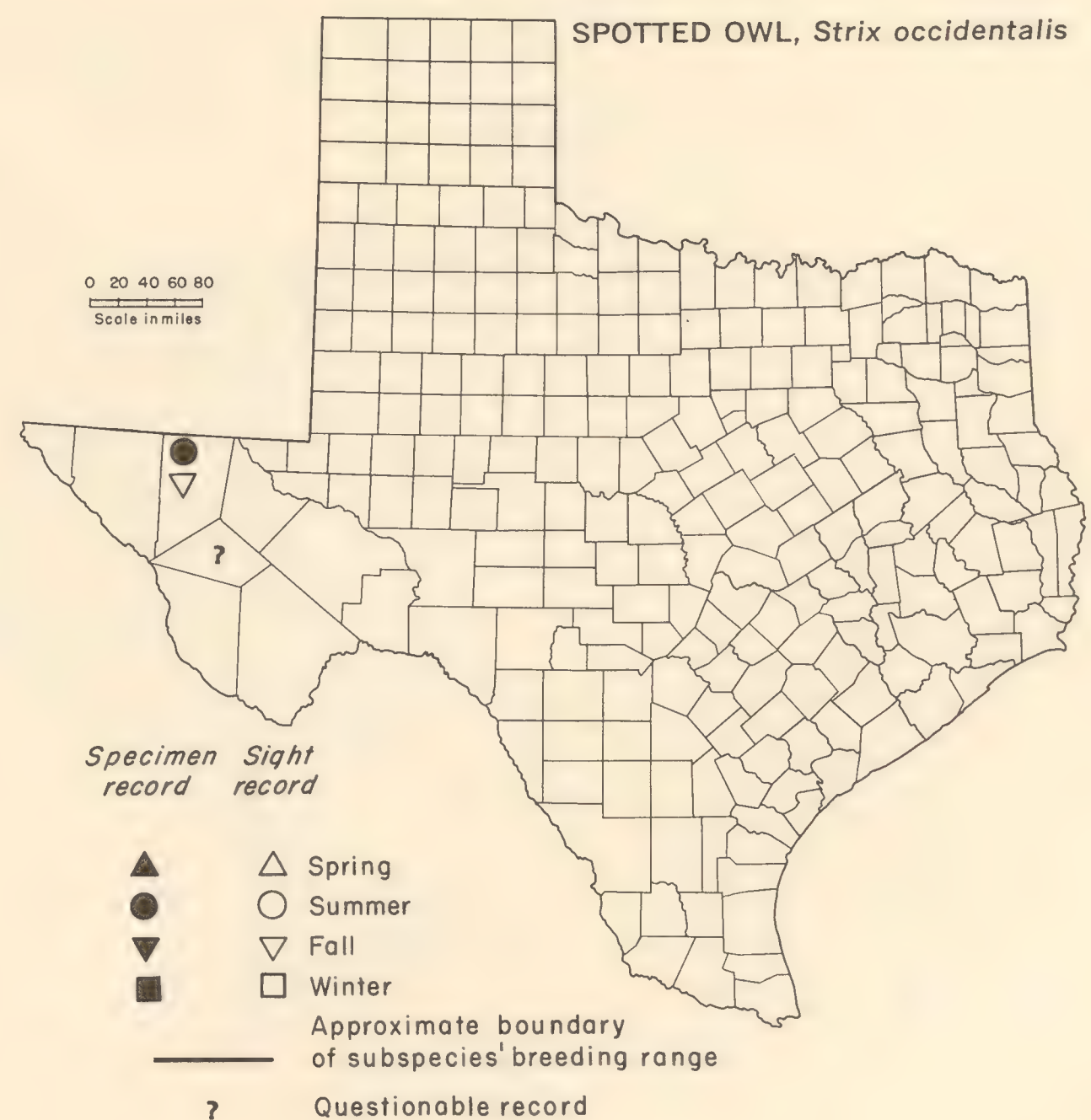
The common hoot of the Spotted Owl is a three-

noted, sometimes four-noted *hoo*, *hoo-hoo* or *whowho*, *hoohoo* which resembles in quality that of the Barred although it is noticeably higher pitched; in addition, the bird utters various barks and a frightening ringing whistle. Female notes are higher than the male's. Vocalizations are most frequent in late winter and early spring.

DETAILED ACCOUNT: ONE SUBSPECIES

MEXICAN SPOTTED OWL, *Strix occidentalis lucida* (Nelson)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper surface warm sepia, conspicuously spotted or barred with buffy white or white; tail buffy brown with several bands of dull buff and white and narrowly tipped with dull white mottled with buffy brown; wing-quills bister, outer webs mostly buffy brown, and with white bars on outer webs of primaries changing to buff and dull buff on inner webs, and on inner secondaries to white toward inner webs, particularly basally; scapulars more or less mottled with white; wing-coverts anteriorly almost unmarked, rest of lesser and greater coverts spotted or mottled with white; lining of wing pale buff mottled with olive brown or bister; facial disks grayish white, mottled or barred with olive brown or clove brown, edge of disks clove brown spotted with white; chin white; upper throat mostly clove brown, spotted or barred with white; middle of lower throat white with a few clove brown mottlings or nearly immaculate; sides of throat, jugulum, and breast buff barred with sepia or warm sepia and spotted or barred with white; remainder of lower surface pale buff or buffy white; middle of abdomen unmarked; sides and flanks broadly barred and somewhat streaked with sepia; crissum narrowly barred with sepia or wood brown; feathers of legs and feet mottled with same colors. Iris plumbeous. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by wear from first winter. Similar to nuptial adults. *First winter* (juvenile plumage of most authors): Acquired by partial postjuvenile molt. Similar to first nuptial male and female but somewhat darker and richer in coloration. *Juvenal* (second



natal down of most authors): Acquired by complete postnatal molt. Upper and lower parts brownish buff, broadly barred with hair brown or wood brown; scapulars strongly tinged with tawny; head hair brown or fuscous, feathers tipped with brownish buff; legs and feet brownish buff, buff, or white, sometimes much mottled or barred with bister; wings and tail as in adult. *Natal*: Dull buff.

MEASUREMENTS: *Adult male*: Wing, 302.0–309.1 (average, 307.3) mm.; tail, 191.0–206.0 (199.7); bill (culmen from cere), 18.8–21.6 (20.3); height of bill at base, 18.5–20.1 (19.3); tarsus, 52.1–54.1 (53.3); middle toe without claw, 31.0–34.5 (32.8). *Adult female*: Wing, 302.0–320.0 (312.2); tail, 196.1–212.6 (205.2); bill, 19.6–23.1 (21.4); height of bill, 18.5–21.6 (19.8); tarsus, 51.6–55.6 (53.8); middle toe, 33.0–38.1 (35.3).

RANGE: C. Colorado, south to Michoacán and Guanajuato.

TEXAS: *Resident*: One specimen: Culberson Co., Guadalupe Mts., McKittrick Canyon, between 7,000 and 7,500 ft. (female, June 18, 1939, W. B. Davis).

NESTING: *Nest*: In canyons or on mountain slopes, or wooded mesas, in hollow in tree, in open nest (usually old nest of hawk or raven) or in crotch of tree limb, shallow cave in canyon wall, some distance from ground; made of twigs and bark; lined with grass, bark, and feathers. *Eggs*: 2–4; oval or rounded ovate; white, unmarked; average size, 52.1 × 45.5 mm.

LONG-EARED OWL, *Asio otus* (Linnaeus)

SPECIES ACCOUNT

See colorplate 11

A slim, medium-sized owl—much smaller than Great Horned—with long ear-tufts (closely spaced near forehead) and long wings which extend beyond tail. Dark brown above mottled with tawny and vermiculated with more or less grayish; essentially black-streaked whitish below; tawny facial disks bordered with black set off yellow eyes. Length, 14¼ in.; wingspan, 3¼ ft.; weight, 10½ oz.

RANGE: Eurasia from about lat. 60° N., south to n.w. Africa, s. Europe, Israel, Himalayas, and Taiwan;

in North America from c. British Columbia to Newfoundland, south to n.w. Baja California, s. Arizona (rarely), w. and n. Texas (rarely), and Maryland. Winters in Eurasia, south to n. Africa, n. India, and s. China; in North America from s. Canada to s. United States and c. highland Mexico, also Bermuda.

TEXAS: (See map.) *Breeding*: Late Feb. to early May (eggs, Mar. 6 to Apr. 9) from 400 to 4,000 ft., probably higher. Rare and highly local in northern third and Trans-Pecos. One record from Comal Co. (eggs, Mar. 28, 1888, G. B. Benner). *Winter*: Early Nov. to late Apr. (extremes: Aug. 12, May 10). Scarce to rare and erratic in most of western two-thirds; rare to casual in south Texas brush country and in eastern third. May appear locally in sizable aggregations when present, notably in El Paso region and northern Panhandle, where at times common.

HAUNTS AND HABITS: The Long-eared Owl lives in moderately dense, thickety groves of cedar (juniper), cottonwood, willow, and sometimes pine and oaks, particularly along streams. In contrast to the Short-eared Owl, it is seldom observed in open country. It is seen singly or in pairs during the breeding season, but in winter individuals often gather to roost communally within dense evergreens.

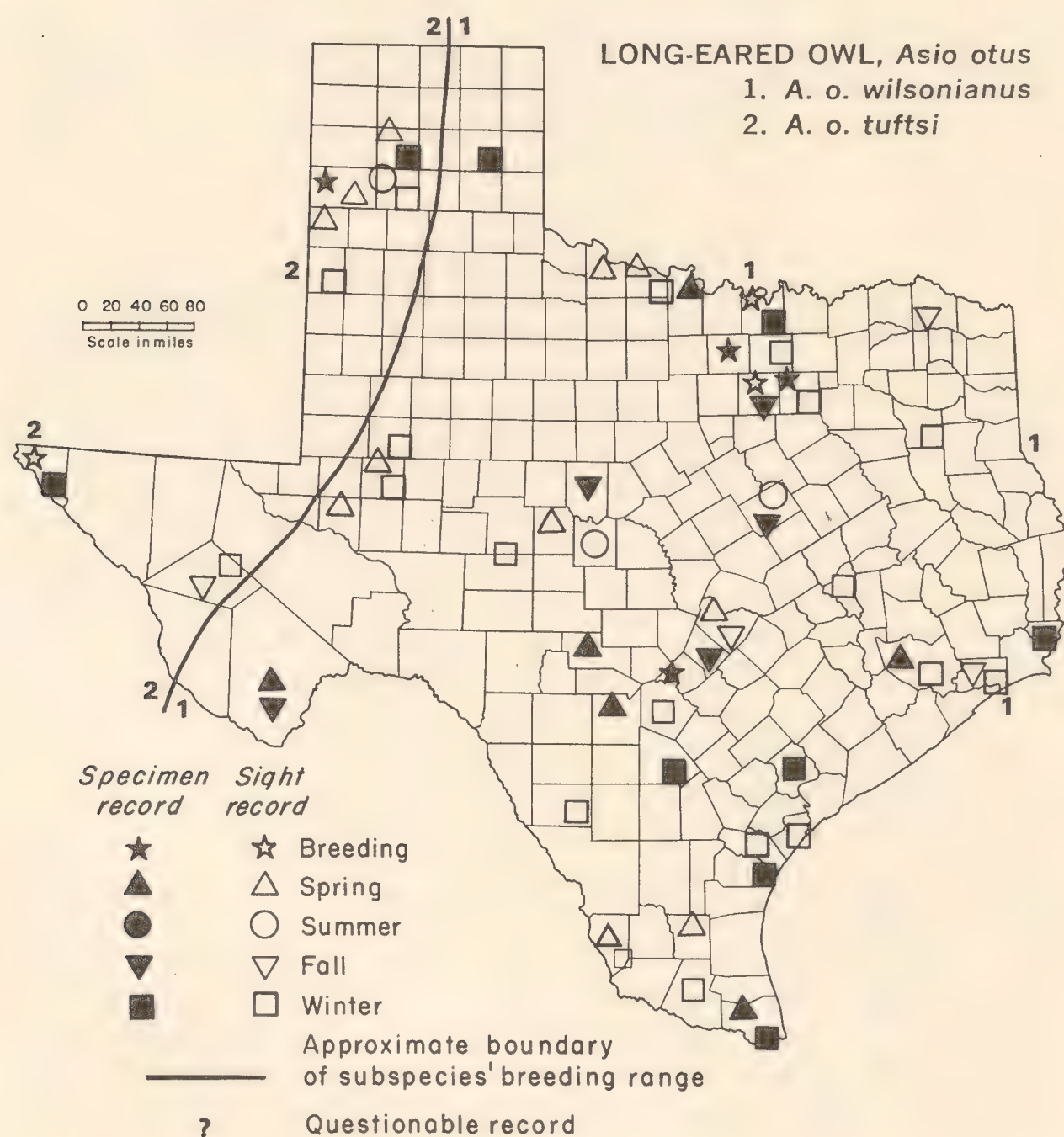
Flight is noiseless, buoyant, and occasionally rather swift; at times movements are fluttering and butterfly-like. On the wing, the bird stealthily approaches its prey, then pounces on it, as do many other owls. After dusk, in early morning before dawn, and on moonlit nights, this owl hunts mice, rats, moles, pocket gophers, and other small mammals; infrequently it takes a small bird. Strictly nocturnal, the Longear secludes itself in the foliage of a tree or bush during the day and is difficult to flush or even to see. In fact, the best way to find this bird is to look on the ground beneath conifers for owl pellets.

The Long-eared Owl vocalizes almost exclusively during the breeding season. The chief call is a series of moaning, drawn-out *hoooo*, *hoooo*'s, etc. Also heard are catlike whines, various shrieks, and a slurred *whee-you* whistle.

DETAILED ACCOUNT: TWO SUBSPECIES

AMERICAN LONG-EARED OWL, *Asio otus wilsonianus* (Lesson)

DESCRIPTION: *Adult male, nuptial plumage (light gray phase)*: Acquired by wear from winter plumage. Upper parts mottled with grayish white and chaetura drab, in places washed with buff, rump and upper tail-coverts with much of this color; ear-tufts brownish black on outer webs, dull buff at base, and much mottled with white on inner webs; tail hair brown with broad mottled bars of drab which become buff on inner webs, except at tips, dull white on outer web of outermost tail feather, and clay color on basal portion of central tail feathers; wing-quills fuscous, barred with drab or light hair brown, these bars on outer webs of primaries basally becoming clay color, on inner webs becoming buff and basally buffy white, these bars narrowest on inner secondaries; upper wing-coverts much like back, greater and median series with a few large spots of white, the former tipped with buffy white; lores and superciliary stripe white; long spot above eye black; rest of facial disk dull buff or



ochraceous, mottled near ends of feathers with fuscous; edge of facial disk chaetura drab or fuscous forming conspicuous bar on side of neck; chin white; center of throat white, separated from chin by band of fuscous-streaked feathers; remainder of lower parts white or buffy white; jugulum and breast streaked and somewhat mottled with chaetura drab, breast and all but center of abdomen much mottled and with broad shaft streaks of same; flanks, crissum, and legs buff or buffy white; longest upper tail-coverts with terminal hastate spots of hair brown and drab, middle of abdomen unmarked; lining of wing buffy white or pale buff. Bill black, greenish slate color, or blackish slate, but mandible sometimes olive gray; cere mouse gray; iris lemon yellow; toes olive gray or light yellowish gray; claws black, brownish black, or slate color. *Adult male, nuptial (dark gray phase)*: Similar to light gray phase, but decidedly darker on both upper and lower surfaces. *Adult male, nuptial (dark ochraceous phase)*: Similar to light gray phase, but upper and lower surfaces very much darker and much more deeply ochraceous (less grayish); breast and anterior lower parts much more heavily marked with bister. Legs and feet much more deeply ochraceous buff. *Adult male, nuptial (light ochraceous phase)*: Similar to dark ochraceous phase, but upper and lower surfaces much paler. *Adult male, winter*: Acquired by complete post-nuptial molt. Like nuptial adult male in corresponding phase. *Adult female, nuptial*: Acquired by wear from winter. Like nuptial adult male in corresponding phase, but somewhat darker both above and below, and with less white (more ochraceous) on lower surface. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female in corresponding phase. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding sex and phase of adults in winter. *Male and female, first nuptial*: Acquired by wear from first winter. Like corresponding sex and phase of nuptial adults. *Male and female, first winter* (juvenal plumage of most authors): Acquired by partial postjuvenal molt. Similar to first nuptial male and female but somewhat more rufescent. *Juvenal* (second natal down of most authors): Upper parts light fuscous or hair brown, barred with white or buffy white, head more broadly barred and more whitish; lower parts dull buffy white, numerous barred with drab or hair brown; chin white; short superciliary stripe and loreal bristles black; wings and tail as in adult. Bill brownish blue or bluish lilac gray, tipped with white; cere olive gray, gray, or yellow; exposed scales of toes light brownish plumbeous; soles of toes grayish white; claws drab gray. *Natal*: White.

MEASUREMENTS: *Adult male*: Wing, 283.9–302.0 (average, 292.1) mm.; tail, 138.9–157.5 (150.6); bill (culmen from cere), 15.0–18.0 (16.8); height of bill at base, 17.0–18.8 (17.8) tarsus, 41.9–47.0 (44.2); middle toe without claw, 24.4–27.9 (26.2). *Adult female*: Wing, 288.0–303.0 (293.9); tail, 143.5–160.0 (151.1); bill, 16.5–18.5 (17.3); height of bill, 17.5–20.1 (18.3); tarsus, 45.0–51.1 (47.8); middle toe, 26.9–31.0 (28.7).

RANGE: N.w. Ontario to Newfoundland, south to n.e. Texas (rarely), c. Illinois, and Maryland. Winters from c. Minnesota and Maine to s. Texas and s. Florida; also Cuba (casually) and Bermuda.

TEXAS: *Breeding*: Altitudinal range, 400 to 1,300 ft. Collected in Clay, Cooke, and Wise (eggs) cos. Eggs from Comal Co. thought to be of this subspecies (see species account). Rare. *Winter*: Taken northwest to Gray, east to Cooke and Orange, south to Cameron, west to Atascosa cos. Scarce.

NESTING: *Nest*: Usually in deep forests, either deciduous or coniferous, in swamps, on cliffs, or in more open country; in tree or bush, usually not over 30 ft. above ground; in natural cavity in tree or in old nest of hawk or owl; composed of sticks and twigs; lined with feathers, grass, and leaves. *Eggs*: 3–8, usually 5; oval; smooth; white, unmarked; average size, 39.9 × 32.5 mm.

WESTERN LONG-EARED OWL, *Asio otus tuftsi* Godfrey

DESCRIPTION: *Adult male and female, nuptial plumage*: Like *A. o. wilsonianus* but somewhat smaller; upper parts lighter,

less blackish and less ochraceous, more grayish or whitish; lower surface also somewhat paler.

MEASUREMENTS: *Adult male*: Wing, 284.0–293.0 (average, 286.4) mm.; tail, 136.0–144.5 (140.2); bill (culmen from cere), 17.0–17.8 (17.3). *Adult female*: Wing, 285.0–295.0 (291.5); tail, 143.0–157.0 (148.8); bill, 16.2–17.9 (17.0).

RANGE: C. British Columbia, s. Mackenzie, and s. Manitoba, south to n.w. Baja California and Trans-Pecos Texas. Winters from c. British Columbia and c. Alberta to c. Baja California, Durango, and Puebla.

TEXAS: *Breeding*: Altitudinal range, about 3,200 to 4,000 ft., probably higher. Four specimens, all immatures: El Paso Co., Tornillo, 3,583 ft. (June 15, 1918, Charles Miller). Eggs collected in Deaf Smith Co., Glenrio (Apr. 9, 1920, A. J. Kirn) thought to be of this subspecies. Rare. *Winter*: Taken north to Potter, east to McLennan (Nov. 18), south to Atascosa, west to Brewster (Nov. 29) cos. Scarce.

NESTING: Similar to that of *A. o. wilsonianus*.

SHORT-EARED OWL, *Asio flammeus* (Pontoppidan)

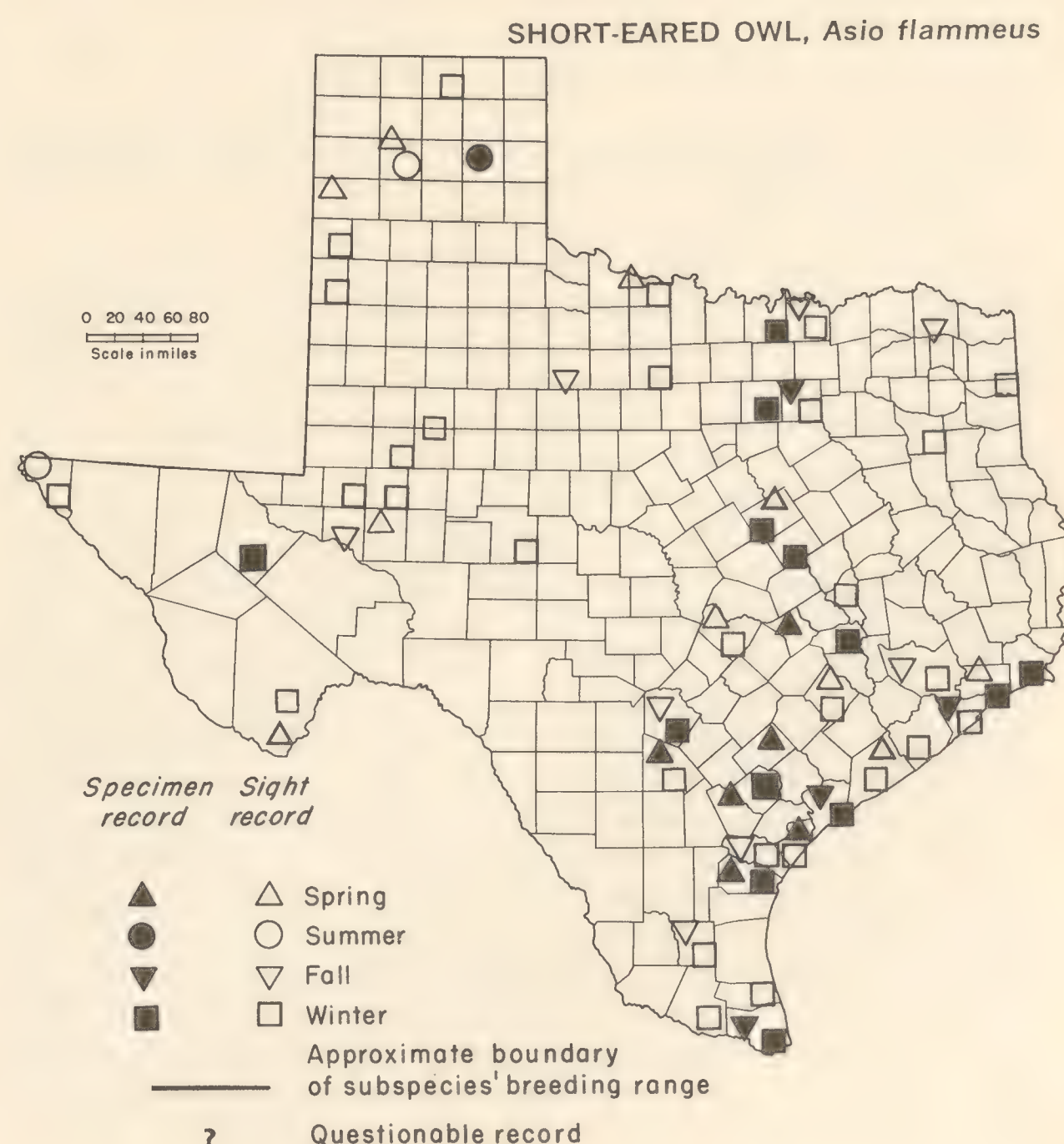
SPECIES ACCOUNT

See colorplate 12

A medium-sized, partly day-flying owl of open country. Brown-streaked tawny head (large and rounded; short ear-tufts seldom visible) and body; extensive buffy wing-patch, large black spot at carpal joint ("wrist") shows in floppy flight; blackish areas in face point up staring yellow eyes. Length, 14¾ in.; wing-span, 3½ ft.; weight, 13 oz.

RANGE: New World and Eurasia, also Hawaiian, Galápagos, and Falkland islands. Migratory races winter in temperate and subtropical Northern Hemisphere.

TEXAS: (See map.) *Winter*: Early Oct. to late Apr. (extremes: Aug. 27, June 21). Fairly common on grassy plains near Gulf; uncommon to rare in open country through remainder of state.



HAUNTS AND HABITS: A most remarkable colonizer is the almost cosmopolitan Short-eared Owl. Long ago, a pair or group of these primarily arctic-to-temperate-nesting, rodent-eating land birds of flat treeless terrain flew across at least 2,400 statute miles of salty Pacific and found the Hawaiian Islands. All factors seemed to be against them, yet they settled down to proliferate on these tropical, steeply mountainous, heavily forested, originally rodentless oceanic islands.

In Texas and other continental locations, the Short-eared Owl prefers sand dunes, marshes, coastal prairies, and grassy plains to forests. In these open habitats it flies low over the grass, often with Marsh Hawks; except for its large head and neckless appearance, the owl could easily pass for a tawny-plumaged Marsh Hawk—female or young male. On the breeding grounds the Short-eared Owl is generally observed singly or in pairs, although occasionally small companies assemble in migration and in good winter feeding areas.

Flight is stronger and swifter than that of many other owls. The Short-eared Owl forages in the manner of a Marsh Hawk; when hunting it circles close to the ground, alternately flapping and sailing, then drops to seize its prey with out-stretched feet. Sometimes it hovers before descending. Field mice and other rodents are favored foods, but the owl also consumes a quantity of insects and infrequently a small bird. In between forays it sleeps or watches for its next meal while perched on a fence post, tree stub, or in a clump of grass. On the rest perch the bird occasionally regurgitates a typical owl pellet—a compactly oblong mass of hair and bones.

The Short-eared Owl is silent except during the nuptial season when it utters, in addition to other squealing and hissing notes, emphatic rasping barks: *kee-yow!* or *wow!*

DETAILED ACCOUNT: ONE SUBSPECIES

COMMON SHORT-EARED OWL, *Asio flammeus flammeus* (Pontoppidan)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts buffy white to dull buff, streaked narrowly on crown, broadly on neck, back, and scapulars, with fuscous or olive brown, these stripes broadest on back and scapulars where they almost obscure ground color, but rump and upper tail-coverts with very few and inconspicuous dark brown markings; tail broadly barred with olive brown or fuscous and with cinnamon buff, buff, or on outermost feathers buffy white, the light bars on middle rectrices mottled with buff, the bars of olive brown or fuscous becoming narrow on outermost feathers and sometimes almost disappearing on outer webs; wing quills fuscous or clove brown, basally with very broad bars, primaries basally with very broad bars of buff or buffy white, entire portion of inner webs at base of this color, secondaries mostly white on inner webs but with narrow fuscous or hair brown bars; tertials olive brown with broad mottled bars of buff or pale buff; wing-coverts olive brown or fuscous black, lesser coverts more or less mottled with buff and dull white, median and greater coverts with large spots of white, buffy white, and pale buff, lining of wing white or buffy white with spot of fuscous or hair brown on posterior outer portion and a few spots of same color elsewhere; ring about eye black; rest of facial disk grayish or buffy white, but succeeded outwardly by

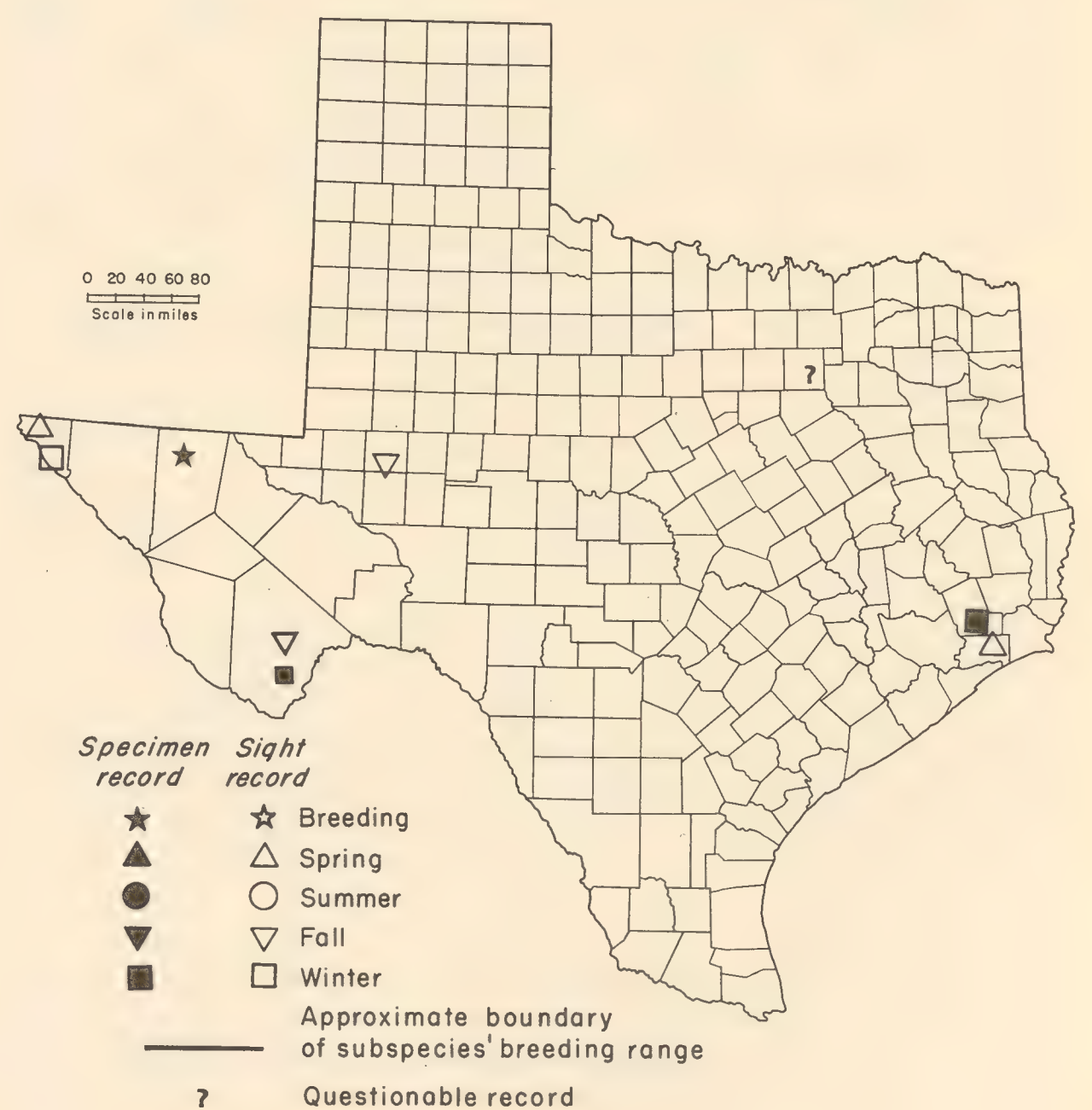
ring of white and edge of clove brown or fuscous, this forming more or less well defined bar on side of neck; chin white or buffy white, edge of disk forming bar of buff and fuscous-striped feathers across upper throat; remainder of lower surface white or very pale buff, broadly streaked with same, crissum, legs, and feet unmarked or with very narrow shaft streaks of dark brown. Bill and cere black or bluish black, but tip of maxilla dull white; iris lemon yellow or chrome yellow; toes olive or drab gray, but naked granular soles of toes Naples yellow, dull yellow, or cream color; claws slate black or brownish black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but light areas more buffy (less whitish). *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but ground color of upper and lower parts light ochraceous tawny or cinnamon, dark brown areas much more rufescent brown, sepia, or bister. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but light areas more deeply buff. *First nuptial:* Acquired by partial prenuptial molt from first winter. Same as nuptial adults. *First winter* (juvenile plumage of most authors): Acquired by partial postjuvenile molt. Similar to adults in winter, but wings and tail of juvenile retained; upper parts darker, duller, more blended; lower parts more deeply ochraceous. Bill slate black, tipped with drab gray; iris chrome yellow; toes pale olive, but soles cream color; claws black.

MEASUREMENTS: *Adult male:* Wing, 297.9–329.9 (average, 312.7) mm.; tail, 136.4–161.5 (148.4); bill (culmen from cere), 15.5–20.1 (17.3); height of bill at base, 18.0–20.1 (18.8); tarsus, 43.9–50.0 (47.3); middle toe without claw, 25.4–27.4 (26.2). *Adult female:* Wing, 300.0–326.2 (311.9); tail, 142.0–158.5 (151.9); bill, 16.5–19.6 (17.8); height of bill, 18.0–20.1 (18.8); tarsus, 46.5–51.1 (48.8); middle toe, 24.9–28.9 (26.9).

RANGE: Widespread in Northern Hemisphere between lat. 70° N. and 35° N.; in North America, from n. Alaska to Baffin Island, south to c. California, Kansas, and s. New Jersey. Winters in Northern Hemisphere to approximately lat. 15° N.; in North America, from s. British Columbia and s. Maine through United States and Mexico to Guatemala, casually to Costa Rica and Cuba.

TEXAS: *Winter:* Taken north to Gray (June 21), east to Dallas and Jefferson, south to Cameron, west to Reeves cos.

SAW-WHET OWL, *Aegolius acadicus*



SAW-WHET OWL, *Aegolius acadicus* (Gmelin)

SPECIES ACCOUNT

A tiny, tuftless, short-tailed owl with yellow eyes; largely chocolate brown above with prominent white wing-spots (birds from Chiapas southward unspotted); broadly chestnut-striped white below; has white-streaked head and complete facial disks. Length, $7\frac{3}{4}$ in.; wingspan, 19; weight, $2\frac{1}{2}$ oz.

RANGE: S. Alaska to Nova Scotia, south locally and erratically to mountains of s. California, s.e. Arizona, c. highland Mexico, New Mexico, n. Trans-Pecos Texas (first discovered, 1973), n.e. Kansas, and Maryland; also mountains of extreme s. Chiapas and Guatemala. Partially migratory in the north, wintering in and near breeding range, and very irregularly south to s.e. United States.

TEXAS: (See map.) *Breeding*: Apparent breeding lately discovered: Culberson Co., Guadalupe Mts., The Bowl (5 juvenal birds called up, June 23, 1973, G. A. Newman; 1 male and 1 female collected, original nos. 433, 434). *Winter*: Early Nov. to early Mar. (extremes: Sept. 28, Apr. 10). Rare visitor in El Paso and Big Bend Nat. Park; casual at Midland and in southeastern corner of state.

HAUNTS AND HABITS: The Saw-whet Owl, so named because of its rasping calls, prefers deep shady interiors of damp coniferous forests; in these summer recesses, often near water, the bird nests in a tree cavity—typically an abandoned woodpecker hole. In Texas, wintering Saw-whets seek woodland situations where conifers are to be found. The species is solitary.

In flight, the Saw-whet resembles the American Woodcock; its movements are swift but more labored and undulating than those of most other owls. Active primarily at dusk and right before sunrise, this bird hunts through lower levels of the woods for mice, rats, young squirrels, shrews, and an occasional insect or small bird; during the day it roosts in dense foliage close to the ground. The species is noted for its apparent tameness and curiosity. Cautious observers, once they have found this bird in its remote haunts, can often watch it at close range without difficulty; when on the nest, this owl generally pops its head out the entrance hole when the trunk is rapped.

Although quiet in the nonbreeding season, the Saw-whet becomes exceedingly vocal in late winter and early spring during the few weeks of mating. Chief among its varied calls are its saw-filing noises, uttered in series of three, and a loud, mellow, regularly repeated whistle: *too, too, too, too, too, too, too*, etc.

DETAILED ACCOUNT: ONE SUBSPECIES

COMMON SAW-WHET OWL, *Aegolius acadicus acadicus* (Gmelin)

DESCRIPTION: *Adults, nuptial plumage (gray phase)*: Ac-

quired by wear from winter plumage. Upper parts rather rufescent hair brown, crown narrowly streaked with dull white, hindneck with more or less well defined collar of broad dull white spots, outer edges of scapulars with large spots of white; tail hair brown narrowly tipped with grayish white and with two or three bars of white which are mostly spots on outer edges of webs, except on outermost feathers; wing-quills olive brown, primaries with a few spots of white on outer webs and with large white spots on inner webs, as have also secondaries; wing-coverts like back, outermost median coverts with large white spots on terminal portion of outer webs, a few greater coverts with similar spots; lining of wing white or buffy white with a few streaks of snuff brown; forehead and broad superciliary stripe grayish white; lores with more or less admixture of blackish bristles; remainder of facial disks pale buff or buffy white; outer edge like color of back and very broadly streaked with white; chin buffy white; upper throat with band of snuff brown somewhat mixed with buff; lower throat white; remainder of lower surface dull white, broadly streaked with snuff brown; legs and feet deep cinnamon buff or ochraceous; lining of wing white or buffy white with a few streaks of snuff brown. Bill black or slate black, tipped with white; cere slate black; iris lemon yellow, straw yellow, or gamboge yellow; toes cream color or light Naples yellow; soles of feet yellowish flesh color, light yellow, or cream color; claws black, slate black, or dark brown. *Adults, nuptial (brown phase)*: Similar to gray phase, but upper surface much more rufescent brown, near bister. *Adults, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adults in corresponding phase. *Second winter*: Acquired by complete postnuptial molt. Like adults in winter in corresponding phase. *First nuptial*: Acquired by wear from first winter, with which it is practically identical. *First winter* (juvenal plumage of most authors): Acquired by partial postjuvenal molt. Very much like adults in winter, but forehead and middle of face chiefly white; upper parts more rufescent. *Juvenal (second down)*: Acquired by complete postnatal molt. Upper parts vandyke brown, chestnut brown, or auburn, almost unmarked except for a few obscure buffy, more or less concealed spots on hindneck and on outer webs of scapulars and a few white roundish spots on wing-coverts; forehead and short superciliary stripe white or buffy white; sides of head clove brown; anterior lower parts like upper surface but more or less streaked with white and buff; sides of throat and extreme part of chin white or buffy white; remainder of lower surface tawny buff or cinnamon buff; wings and tail as in adult. Bill and cere slate black; iris lemon yellow; soles of toes light maize yellow; claws brownish black. *Natal*: White.

MEASUREMENTS: *Adult male*: Wing, 132.6–138.9 (average, 135.6) mm.; tail, 66.0–69.1 (67.3); bill (culmen from cere), 10.4–13.0 (11.7); height of bill at base, 10.4–12.4 (11.2); tarsus, 21.1–25.9 (24.1); middle toe without claw, 15.5–17.0 (16.3). *Adult female*: Wing, 135.9–146.0 (141.5); tail, 69.1–74.4 (71.9); bill, 10.9–13.5 (12.2); height of bill, 10.9–13.0 (11.9); tarsus, 23.1–25.9 (24.6); middle toe, 15.5–18.0 (16.8).

RANGE: Identical to that of species with exception of Queen Charlotte Islands of British Columbia, also Chiapas and Guatemala. Winters in breeding range and rarely through Mexico to Oaxaca; rarely in s.e. United States.

TEXAS: *Breeding*: Racial status not officially assigned to 1973 specimens taken in Guadalupe Mts.; however, *A. a. acadicus* is the common subspecies of North America (see species account). *Winter*: Two specimens: Brewster Co., Big Bend Nat. Park, Boot Spring, 6,300 ft. (Feb. 23, 1968, R. H. Wauer); Liberty Co., near Dayton (found dead on road, Dec. 22, 1951, W. J. Hamilton III; Louisiana State University collection).

NESTING: *Nest*: In mountain forests, wooded swamps, or timbered stream valleys; in cavity in tree or in deserted nest of squirrel, or hawk, crow, or similar bird; when in a tree hollow, the only material is chips of wood with a few grasses or feathers. *Eggs*: 3–7, usually 5 or 6; oval or slightly ovate; smooth, not glossy; white, unmarked; average size, 29.9×24.9 mm.

Goatsuckers: Caprimulgidae

CHUCK-WILL'S-WIDOW, *Antrostomus carolinensis* (Gmelin)

SPECIES ACCOUNT

Caprimulgus carolinensis of A.O.U. check-list, 1957 (see Appendix A). A very large goatsucker; its presence most frequently announced by its *chuck-will's-widow* call. Eyes of both sexes glow like live coals in flashlight beam (G. M. Sutton). *Male*: buffy brown, much mottled, vermiculated, and barred with blackish and cinnamon; reddish brown throat bordered posteriorly by narrow, ill-defined white crescent; inner webs of outer feathers in buffy tail mainly pure white. *Female*: similar, but throat-band and entire outer tail feathers buff, causing her to appear overall buffy brown. Length, 12¼ in.; wingspan, 25¼; weight, 2¾ oz.

RANGE: E. Kansas to s. Ohio and s. New Jersey, south to c. Texas, Gulf coast, and s. Florida. Winters chiefly in Central America, Colombia, Bahamas, and Greater Antilles; a few north to U.S. Gulf coast (irregularly) and Florida.

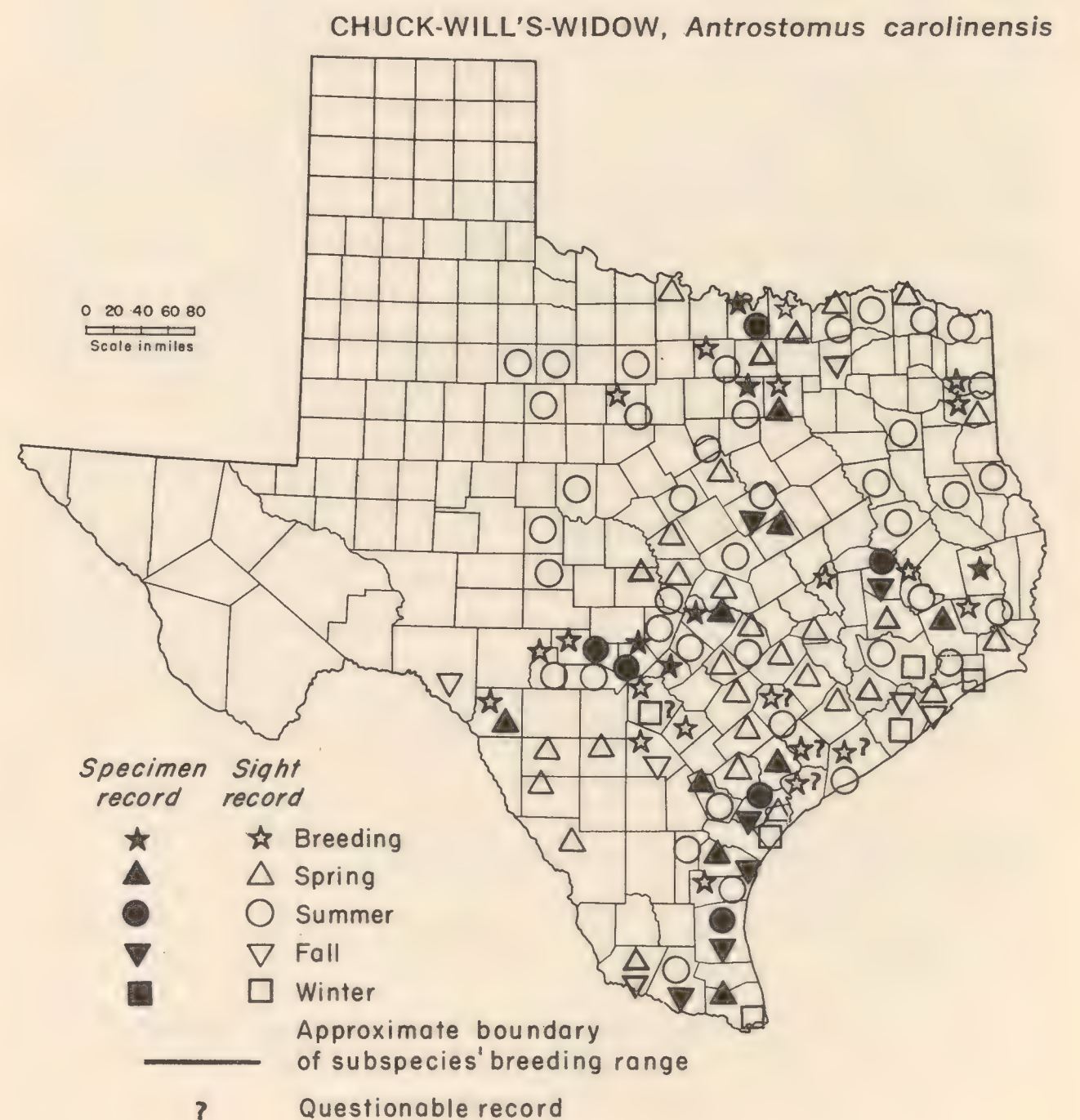
TEXAS: (See map.) *Breeding*: Early Apr. to early July (eggs, Apr. 8 to June 16) from near sea level to 1,900 ft. Common to fairly common in most of eastern two-thirds south to Kinney, Bexar, Wilson, Lavaca (nesting strongly suspected), Brazos, San Jacinto, and Hardin cos.; uncommon to scarce and irregular south to Atascosa, Calhoun, and Matagorda cos.; rare south to Bee, Nueces, and Kleberg cos. Likely nests occasionally in heavily wooded sections of upper coast, but actual evidence lacking. *Migration*: Late Mar. to early May; mid-Aug. to early Oct. (extremes: Feb. 15, May 19; July 26, Oct. 26). Common to fairly common through most of eastern two-thirds; uncommon along 100th meridian west to Stonewall and Val Verde cos. *Winter*: No specimen, but careful sightings from Nov. 23 to Dec. 30; no Jan. records. Casual along coast; two inland records at San Antonio (Dec. 26, 1965, David Wolf; Dec. 30, 1967, C. R. Bender).

HAUNTS AND HABITS: The Chuck-will's-widow is the largest U.S. member of the world-wide Caprimulgidae. (This family, usually considered to include the night-hawks, contains 67 species.) This southern cousin of the Whip-poor-will is still generally called "whip-poor-will" by non-naturalists. During the day, the Chuck

remains camouflaged in shadowy pine and mixed woodlands of eastern Texas and cedar-covered hills and valleys of the Edwards Plateau; from these daytime retreats it ventures into more open country at night. Migrants scatter into south Texas brush country. Typical of its family, this nightjar is a solitary species seen singly or in pairs; small companies may be observed during migration.

Flight on blunt-tipped wings is quick, noiseless, and owl-like. The Chuck-will's-widow makes erratic sweeps a few feet from the ground as it forages for nocturnal insects—moths, beetles, flies, winged ants, and others; occasionally the exceedingly large-gaped bird swallows a hummingbird, sparrow, or warbler, but apparently takes them only incidentally. Daytime roosts are on a rock, mossy log, tree trunk, or on the sandy shoulder of a rural road. When startled, it dashes up easily, alternately flapping and sailing; often it makes a full circle and returns to a spot near where it was flushed.

The vocalization of the Chuck, typically given from a low perch, is a four-note call comprised of a deep,





Top to bottom:
Common Nighthawk, *Chordeiles minor*; Whip-poor-will, *Setochoalcis vocifera*; Chuck-will's-widow, *Antrostomus carolinensis*

low *chuck* (sometimes inaudible) followed by a clear, loudly whistled *will wid-ow* accented on the *wid*; often the bird persists through most of the night. In flight, Chuck-will's-widows utter eerie growling noises as they hunt. The Chuck calls frequently from late April into July.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts finely mottled and vermiculated with mummy brown, bistre, buff, cinnamon buff, and dull white, in places finely spotted with these colors; back darker and more brownish; upper tail-coverts paler and more rufescent; pileum more grayish and broadly streaked centrally, but narrowly and irregularly elsewhere, with black, as are scapulars; rest of upper surface less conspicuously so streaked; a few more or less evident streaks of pale buff or tawny on hind-neck; middle tail feathers similar to upper tail-coverts and with irregular barlike spots across shaft, markings on these feathers producing more or less barred effect; remainder of tail, on outer webs and at tips dull tawny ochraceous vermiculated with fuscous black, most of middle and terminal portions of these feathers pure white; wing-quills fuscous with mottled bars of tawny ochraceous becoming more finely mottled and duller at tips; wing-coverts similar to upper tail-coverts but median and some lesser coverts with rather large spots of buff or buffy white; narrow superciliary stripe mixed dull black and dull white; sides of head dull ochraceous or dull tawny, much mixed with dull black; chin and upper throat same, very narrowly barred with fuscous black; lower throat with distinct collar of buffy white or very pale buff; breast and jugulum fuscous black, finely and much mixed with buff, cinnamon, and dull white, least so anteriorly and medially, breast with a few median spots of dull white or cinnamon; posterior lower parts dull cinnamon or pale dull buff, narrowly barred and mottled with fuscous black, crissum barred with same, sometimes without vermiculations; lining of wing dull cinnamon, much barred and spotted with fuscous black. Bill brown, darker at tips; iris dark brown; legs and feet dark brown. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but without white areas on inner webs of tail feathers, entire tail being mottled and barred like middle rectrices, but outer feathers tipped with dull cinnamon which is slightly or not at all vermiculated with darker brown. *Adult male and female, winter:* Acquired by complete postnuptial molt. Similar to corresponding sex of nuptial but somewhat darker. *Male and female, second winter:* Acquired by complete postnuptial molt. Like corresponding sex of adults in winter. *Male and female, first nuptial:* Acquired probably by wear from first winter. Like nuptial adult female. *Male and female, first winter:* Acquired by partial postjuvinal molt. Like first nuptial. *Juvenal:* Acquired by complete postnatal molt. Similar to nuptial adult female, but colors duller, paler, and more blended; pileum buff but much overlaid with fine vermiculations of pale hoary gray and with a few black dots; median upper wing-coverts almost plain buff; scapulars and tertials much more nearly uniform buff or grayish buff; vermiculations and other markings much less conspicuous; lower parts very much duller and more blended; abdomen and crissum pale buff or buffy white, with relatively few brown bars and spots, these pale and dull. *Natal:* Buff or light yellowish brown; shoulders and cheeks darker; thighs more ochraceous.

MEASUREMENTS: *Adult male:* Wing, 206.5–225.1 (average, 213.9) mm.; tail, 138.4–151.1 (144.3); bill (exposed culmen), 8.9–14.5 (12.4); tarsus, 17.5–19.0 (18.3); middle toe without claw, 17.0–19.0 (18.3). *Adult female:* Wing, 201.4–215.1 (209.0); tail, 130.0–144.0 (136.1); bill, 8.9–13.5 (11.7); tarsus, 17.0–19.0 (17.8); middle toe, 17.5–19.6 (17.8).

TEXAS: *Breeding:* Collected north to Cooke, east to Tyler (eggs), south to Nueces, west to Kinney and Kerr cos. *Migration:* No specimen collected outside breeding range.

NESTING: *Nest:* In coniferous or deciduous, sometimes mixed, woods, in brush or scrub on rocky or sandy slopes; no nest material, but eggs laid on dry leaves or bare ground. *Eggs:* 2; oval to elliptical oval; somewhat glossy; cream color, white, or pale grayish white; spotted and mottled with various shades of drab, pearl gray, and lavender, and sometimes mixed with shades or irregular lines of brown and reddish brown; average size, 35.8 × 25.7 mm.

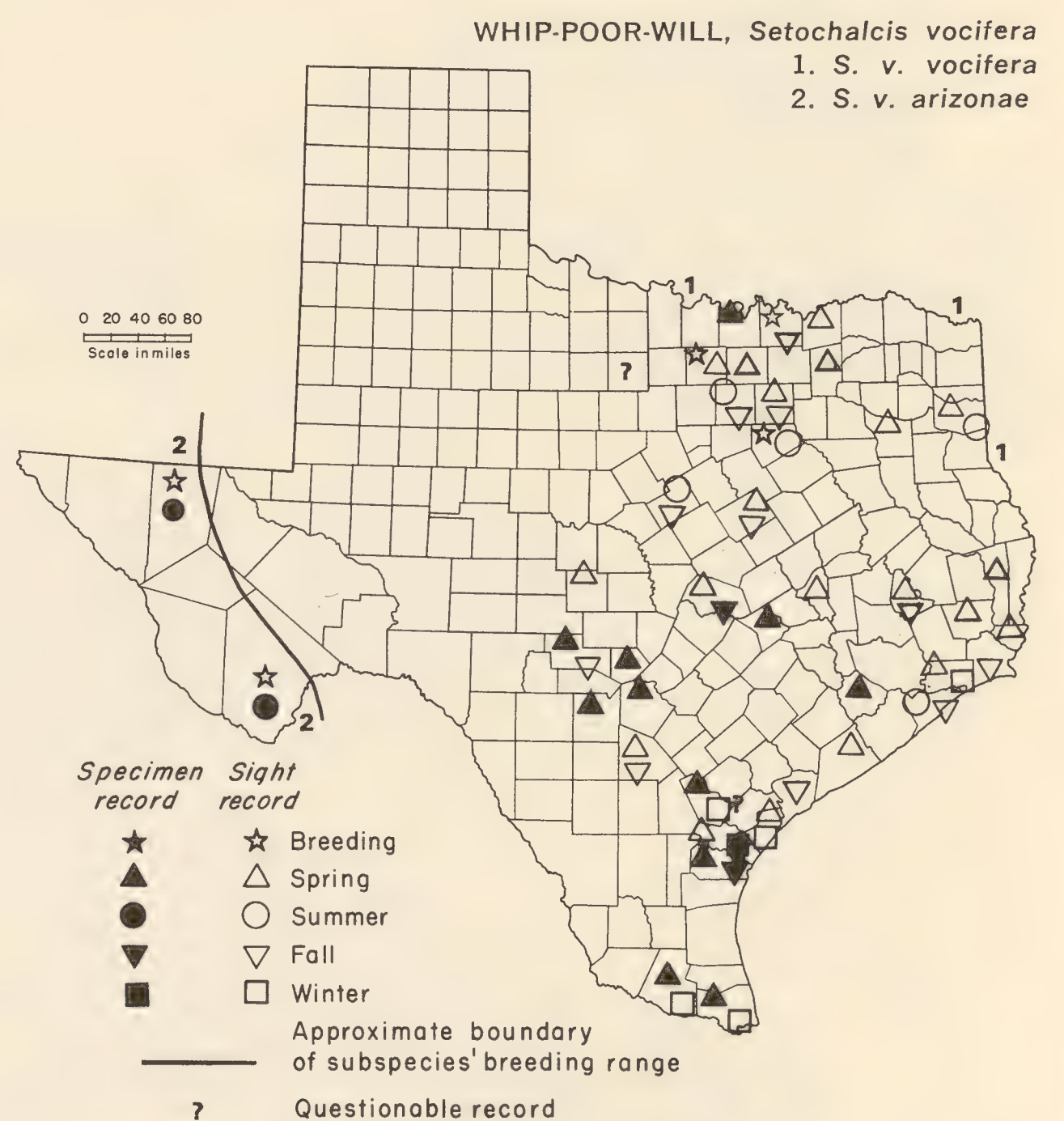
WHIP-POOR-WILL, *Setochalcis vocifera* (Wilson)

SPECIES ACCOUNT

Caprimulgus vociferus of A.O.U. check-list, 1957 (see Appendix A). A medium-sized goatsucker. Vigorous *whip-poor-will* whistle is diagnostic. *Male:* chiefly grayish brown, liberally mottled and vermiculated with blackish and buff; blackish throat bordered posteriorly by narrow, white crescent; outer feathers of grayish tail very broadly tipped with white. *Female:* similar, but throat-band and outer tail feathers dull buff, causing her to appear entirely grayish brown. Length, 9¾ in.; wingspan, 18½; weight, 2½ oz.

RANGE: C. Saskatchewan and s. Manitoba to Nova Scotia, south to e. Oklahoma (very likely breeds), w. Arkansas, n. Alabama, extreme n. Georgia, e. North Carolina, and coastal Virginia; also c. Arizona to Trans-Pecos Texas, south through highland Mexico to mountains of El Salvador and Honduras. Winters mainly from Mexico to Honduras; a few in extreme s.e. United States from Gulf coast and s.e. North Carolina through Florida.

TEXAS: (See map.) *Breeding:* Mid-Apr. to at least mid-June, probably later (2 eggs found, 3 mi. southeast of Decatur, Wise Co., about 1,100 ft., May 20, 1891,



R. L. More; male incubating 2 eggs, near Boot Spring, Chisos Mts., May 4, 1932, E. C. Jacot; nest located, Guadalupe Mts., F. R. Gehlbach) from 5,500—formerly about 300—to 8,000 ft. Fairly common in Guadalupe and Chisos Mts.; formerly (prior to 1940) rare in north central Texas. *Migration*: Late Mar. to early May; late Aug. to late Oct. (extremes: Mar. 11, May 14; Aug. 7, Nov. 11). Common to fairly common in and near Trans-Pecos breeding range; uncommon along coast; scarce to rare in remainder of eastern two-thirds. *Winter*: Dec. 1 to Feb. 14, possibly to Mar. 15. Rare to casual along coast and in Rio Grande delta.

HAUNTS AND HABITS: Classical U.S. nightjar is the Whip-poor-will. In fact, even in the latter half of the twentieth century most Americans know of only two birds that call at night: the “hoot owl” and “whip-poor-will.” In Trans-Pecos Texas, breeding birds inhabit thickets and pine-juniper-oak woods in brushy canyons and on mountain slopes. Migrants in eastern portions of the state pass through more or less hilly, often rocky and brushy, country with scattered woodlands where they usually seek thickets along streams; these birds rarely appear on open prairies. Whip-poor-wills are seen for the most part singly or in pairs and are almost entirely nocturnal or crepuscular.

Flight is silent, smooth, and at times swift; the Whip-poor-will's easy sweeps on short broad wings are readily distinguishable from the jerky movements of a nighthawk. On the wing it obtains a variety of winged insects. As with other goatsuckers, this bird's mid-air pursuits of prey are greatly facilitated by its cavernous mouth flanked by ample whiskerlike rictal bristles. It also searches rotten logs and occasionally amid leaves on the ground for ants, caterpillars, beetles, worms, and other insects. Often at night Whip-poor-wills are found taking dust baths on or along country roads. During the day the birds retreat to interior branches of trees, bushes, logs, rocks, or similar places of concealment.

The call of this nightjar is a whispery, whistled *whip-poor-weel* or *prrrrip-purr-rill* with the first and particularly the last syllables accented; preceding the call is a *chuck* note seldom heard unless the listener is in very close range. The *whip-poor-will* of *S. v. arizonae* has a very burry sound. The vocalization is vigorously and regularly repeated; typically the bird starts at dusk and continues for several hours, resuming again in the early morning for several hours until dawn. Sometimes a Whip-poor-will can be startlingly atypical. The senior editor of the present work has never gotten over the shock he received when he witnessed at close range a bird repeating in full volume his burry *whip-poor-will* at high noon on a clear, blazing-hot summer day! The individual called for five minutes while perched on the ground in the shade of an Arizona cypress (*Cupressus arizonica*) beside Boot Spring, Chisos Mountains, Big Bend National Park in July, 1954. Normal nocturnal calling extends chiefly from late April to early August.

CHANGES: The Eastern Whip-poor-will, *S. v. vocifera*, appears to be among the numerous northeastern U.S. nesting birds which are retreating northward—and out of Texas—as breeders. However, nesting records for this subspecies in both the nineteenth and twentieth centuries are too few for any firm conclusions to be drawn.

An oddity in the distribution of Stephen's Whip-poor-will, *S. v. arizonae*, is that it seems never to have bred in the Davis Mountains, although it was, and still is, a fairly common nester in the Guadalupe to the north and the Chisos range to the southeast. Since 1930 and especially since 1950, the Davis clump has been too arid, barren, overgoated, and bushless to support Whip-poor-will reproduction, but prior to 1930 these same mountains were lush with pine-juniper-oak woods, bushes, and even apple orchards. Why the Whip-poor-will did not make use of the Davis Mountains in their flourishing years is a mystery.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN WHIP-POOR-WILL, *Setochalcis vocifera vocifera* (Wilson)

DESCRIPTION: *Adult male, nuptial plumage (gray phase)*: Acquired by wear from winter plumage. Pileum light hair brown, very minutely vermiculated with blackish brown and broadly streaked, particularly near middle of head, with black; remainder of upper surface chaetura drab, minutely vermiculated with dull black, forming in places narrow irregular shaft streaks, also to some extent vermiculated with buff or cinnamon buff on hindneck; upper tail-coverts somewhat more grayish, two middle pairs of tail feathers hair brown or light fuscous with broad irregular mottled bars of neutral gray or pale brownish gray becoming buff or cinnamon on inner webs, second pair and three outer tail feathers dull black or fuscous black somewhat mottled with cinnamon basally and with terminal half or third pure white; wing-quills fuscous or olive brown, primaries with outer webs spotted with cinnamon or ochraceous tawny, tips vermiculated with buff, inner webs with mottled bars of cinnamon or ochraceous tawny; secondaries similarly barred; scapulars with inner webs black, outer webs buffy white or tawny with large subterminal spots of black; wing-coverts fuscous or olive brown, on their exposed portions much vermiculated with cinnamon, tawny, and buff, and median coverts with large terminal spots of buff or cinnamon; sides of head and neck cinnamon, mixed and vermiculated with fuscous black; chin and throat fuscous black, narrowly barred with dull cinnamon or buff, also with narrow white collar on throat, behind this a partial collar of buff or ochraceous buff; breast fuscous black, minutely vermiculated with gray or dull buff; remainder of lower parts buffy white or pale buff, much vermiculated and barred with fuscous or fuscous black; crissum with narrow irregular bars of fuscous black or practically unmarked; lining of wing cinnamon or dull tawny, spotted and mottled with fuscous or fuscous black. Bill brown, tip black; iris dark brown; legs and feet brown, reddish flesh color, or reddish purple; scales and claws blackish. *Adult male, nuptial (tawny phase)*: Similar to gray phase but darker; pileum, hindneck, back, scapulars, and upper wing-coverts, as well as lower surface, much more tawny or ochraceous (less grayish). *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male in corresponding phase. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male in corresponding phase, but lacking large white spots on three outer tail feathers, these being broadly tipped with dull buff or light clay color; light throat-band less purely white, often buff. *Adult fe-*

male, winter: Acquired by complete postnuptial molt. Similar to nuptial adult female in corresponding phase. *Male, first nuptial*: Acquired by wear from first winter. Very similar to nuptial adult male in corresponding phase. *Male, first winter*: Acquired by partial postjuvinal molt. Very much like corresponding phase of adult male in winter. *Female, first nuptial*: Acquired by wear from first winter. Similar to nuptial adult female in corresponding phase. *Female, first winter*: Acquired by partial postjuvinal molt. Like corresponding phase of adult female in winter. *Male, juvenal*: Acquired by complete postnatal molt. Wings and tail similar to adult male, but crown with much less black streaking; upper surface much more uniform buff or brown; wing-coverts and scapulars dark brownish buff or clay color, but practically without vermiculations; scapulars with large spots of black; chin and throat buff with a few blackish markings; white collar on throat replaced by buff; remainder of lower surface paler, posteriorly almost plain buff, all these parts with much fewer and coarser bars and spots than in adult male. Bill black; tongue and inside of mouth white; hind part of tarsus white; upper surface of toes drab; soles of toes white; claws black. *Female, juvenal*: Acquired by complete postnatal molt. Similar to juvenal male, but three lateral tail feathers tipped with ochraceous buff instead of much larger area of white. *Natal*: Pale buff or yellowish brown.

MEASUREMENTS: *Adult male*: Wing, 149.1–168.4 (average, 158.8) mm.; tail, 113.5–128.0 (123.0); bill (exposed culmen), 10.4–14.0 (13.2); tarsus, 15.5–18.0 (16.8); middle toe without claw, 15.5–18.0 (16.5). *Adult female*: Wing, 147.1–163.1 (155.2); tail, 104.9–123.5 (116.1); bill, 9.9–14.0 (12.4); tarsus, 16.0–18.0 (16.5); middle toe, 16.0–17.5 (16.8).

RANGE: C. Saskatchewan to Nova Scotia, south to n.e. Texas (formerly), n. Alabama, and e. North Carolina. Winters from s. Texas (casually) and e. North Carolina (rarely) through extreme s.e. United States and e. Mexico to Costa Rica (casually).

TEXAS: *Breeding* (probably extirpated): Altitudinal range, probably about 300 to 1,100 ft. No specimen, but nesting observations in Wise Co., Decatur (see species account) and Ellis Co., Palmer (pair nesting, June 1, 1922, E. O. Burns) almost certainly pertain to this subspecies. Formerly rare. *Migration*: Collected north to Cooke, east to Fort Bend, south to Cameron, west to Kerr cos. Uncommon. *Winter*: One specimen: San Patricio Co., San Patricio (Dec., year unknown, F. B. Armstrong).

NESTING: *Nest*: In open woodlands, margins of forests, on hill-sides or lowlands, often along streams, but also in dry situations; in slight depression on ground without materials, eggs laid on leaves on bare ground. *Eggs*: 2; oval to elliptical oval; somewhat glossy; white; spotted, blotched, and lined with various shades of brown, with shell markings of drab, lilac, lavender, and gray; average size, 29.2 × 21.4 mm.

STEPHEN'S WHIP-POOR-WILL, *Setochoalcis vocifera arizonae* (Brewster)

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *S. v. vocifera* but larger; rictal bristles longer and stouter; general coloration averaging paler.

MEASUREMENTS: *Adult male*: Wing, 162.1–168.9 (average, 165.4) mm.; tail, 114.0–134.6 (124.2); bill (exposed culmen), 12.4–16.0 (14.7); tarsus, 15.0–18.5 (16.8); middle toe without claw, 15.5–19.0 (16.8). *Adult female*: Wing, 156.2–166.6 (162.3); tail, 114.0–128.0 (121.2); bill, 13.5–15.5 (14.5); tarsus, 15.5–18.0 (16.8); middle toe, 15.5–18.0 (16.8).

RANGE: S. Arizona to Trans-Pecos Texas, south to Jalisco. Winters probably in Mexico.

TEXAS: *Breeding*: Altitudinal range, 5,500 to 8,000 ft. Collected in Chisos Mts., Brewster Co. One specimen (probably this race) from Guadalupe Mts., Culberson Co., The Bowl, 7,000 ft. (male, testis 10 mm., June 3, 1969, G. A. Newman, original no. 149; Texas A&M University collection). Fairly common.

NESTING: *Nest*: In rocky wooded canyons, on forested mountain slopes, or mesas; in slight depression in ground, without materials, eggs laid usually on leaves, or on dry ground. *Eggs*:

1–2, usually 2; elliptical oval; a little glossy; white or light cream color; immaculate, but sometimes with obscure markings of pale lavender or a few brownish spots; average size, 29.7 × 22.1 mm.

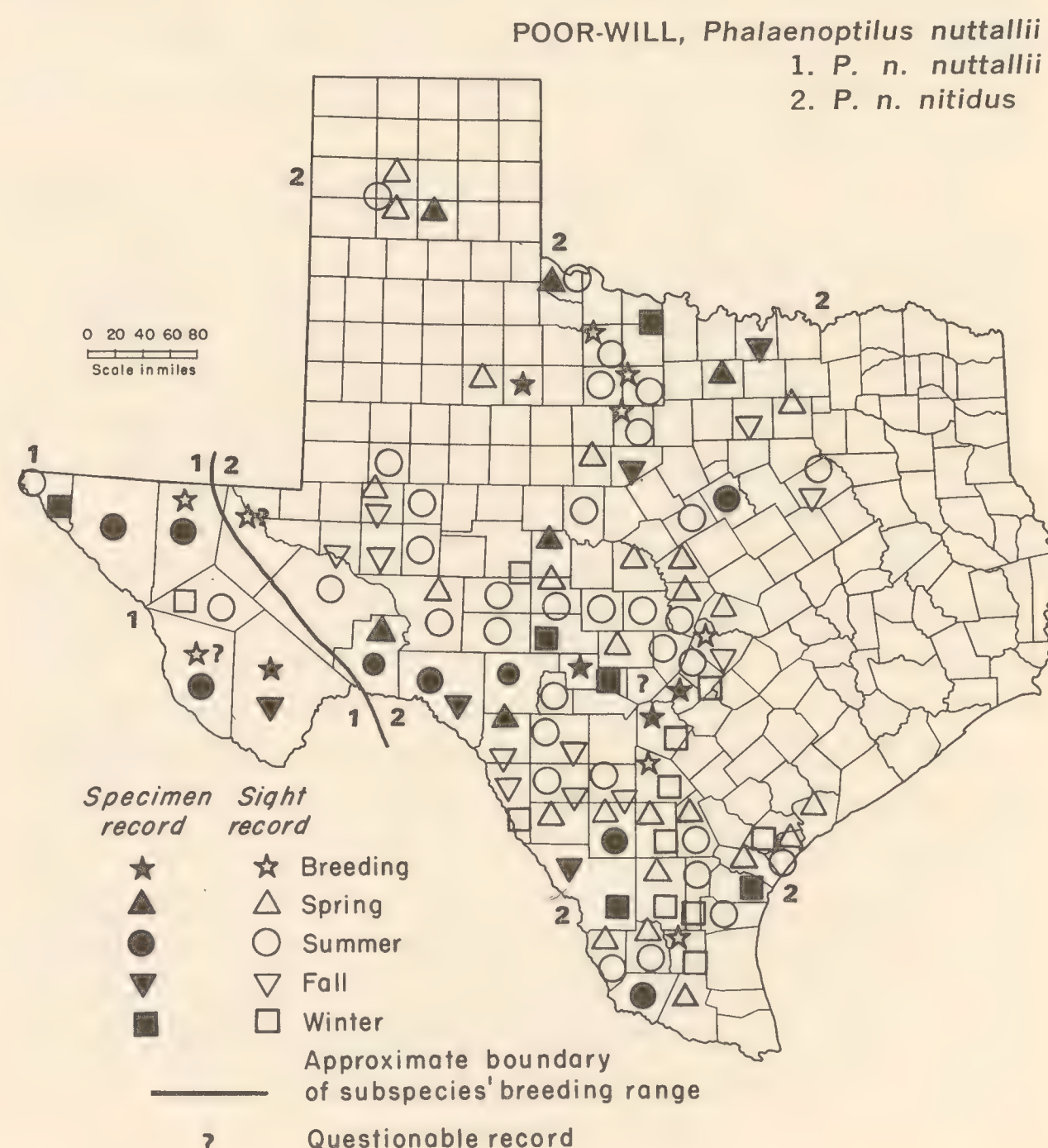
POOR-WILL, *Phalaenoptilus nuttalli* (Audubon)

SPECIES ACCOUNT

Smallest U.S. nightjar. *Poor-will* call is distinctive. Bird suggests a wee, short-tailed Whip-poor-will, but grayer with more white on throat, less white in tail. Eyes glow like pink-hot coals in flashlight beam (G. M. Sutton). Length, 7¾ in.; wingspan, 17¼; weight, 1½ oz.

RANGE: California, s.e. British Columbia, and Nebraska, south through w. United States to s. Baja California, Jalisco, Guanajuato, Coahuila, and w. Texas. Winters mainly in Mexico; a few north to c. California, s. Arizona, and s.w. Texas. Recorded hibernating in California and Arizona.

TEXAS: (See map.) *Breeding*: Mid-Mar. to mid-Aug. (eggs, Mar. 21 to July 26) from about 200 to 8,400 ft. Common to uncommon in most of hilly western half east to Wichita Falls (nesting probable), Meridian State Park (nesting likely), Austin, San Antonio, Beeville, Falfurrias, and Edinburg (fide R. T. Peterson); scarce and local in northern Panhandle (nesting suspected). *Migration*: Feb. and early Mar. to early May; late Aug. to late Oct. (extremes: Jan. 30, late May; Aug. 8, Nov. 11). Common to fairly common through most of breeding range; uncommon to scarce in remainder of Panhandle; rare to casual east to Gainesville, Dallas, Corsicana, Bastrop, and central coast. *Winter*: Late Nov. to late Jan. Rare to casual in Trans-



Pecos, on Edwards Plateau, and in south Texas brush country.

HAUNTS AND HABITS: The gentle-voiced Poor-will—"whose plumage has the exquisite bloom of the moths, which also fly in the hours of shadow," as Florence Merriam Bailey wrote—covers itself with distinctions. On a world basis it is famous for being the first bird species proved (in 1946) to hibernate. In the United States it is known as the smallest, most compact, and, therefore, the cutest goatsucker; in temperate North American deserts it is the most widespread nightjar. In western Texas, this bird inhabits chiefly stony mountains, hills, mesas, cliffs, slopes, and ridges where ground is bare or scattered with junipers, oaks, cat-claws (*Acacia*), and other brush. Seldom are Poor-wills found except singly or in pairs.

Flight, like that of the Whip-poor-will, is noiseless, buoyant, and at times swift. The nocturnal Poor-will is active in moonlight and bright starlight from dusk on through the night. During the day it generally rests hidden in brush on the ground; at night it seeks higher vantages on rocks, low branches, and posts from where it calls and dashes out to catch passing insects. It also feeds by skimming near the ground, erratically twisting and turning as it chases moths, beetles, chinch bugs, locusts, and other small night-flying insects. A convincing defense mechanism of the Poor-will, observed in a wounded bird, is to utter hisses and open wide its large mouth while flopping on the ground.

Heard at close range, the Poor-will's mellow call, usually delivered from the ground or a rock, is a loud, three-note *poor-will-ee* or *poor-jill-ip*; from a distance this softens into a shorter *poor-will* or *poor-jill*. In mid-air it utters clucking notes. Except in very cold weather, when the bird becomes lethargic, torpid, or even hibernates a bit, the Poor-will calls all year.

DETAILED ACCOUNT: TWO SUBSPECIES

NUTTALL'S POOR-WILL, *Phalaenoptilus nuttallii nuttallii* (Audubon)

DESCRIPTION: *Adult male, nuptial plumage (light phase):* Acquired by wear from winter plumage. Upper parts dull dark drab or light hair brown, including scapulars, wing-coverts, and tertials, feathers barred or with hastate subterminal shaft spots of black; tail fuscous black, middle tail feathers with broad mottled bars of hair brown or drab, remaining rectrices with narrow mottled bars of rufescent brown changing to cinnamon on inner webs, three outer rectrices broadly tipped with white; wing-quills fuscous or fuscous black, broadly barred with buff, cinnamon buff, or clay color, these bars somewhat mottled with hair brown or fuscous on tertials and becoming mottled bars of light brown or drab at tips of wing-quills; sides of head dull black, slightly mixed and vermiculated with drab; sides of neck drab like upper surface; chin fuscous black; crescent on throat white, below this a bar of plain fuscous black; breast like upper surface, barred narrowly with black; posterior lower surface very pale buff, narrowly and numerously barred with fuscous or fuscous black, but crissum unmarked; lining of wing light buff, spotted with fuscous. Bill black; inside of mouth flesh color; eyelids ochraceous brown; iris raw umber, dark hazel, or black; legs and feet dark plumbeous, pale grayish lilac, or dull purple; toes dull sepia; claws black. *Adult male, nuptial (dark*

phase): Similar to light phase, but upper surface very much darker; ground color often blackish; lower parts also darker and more deeply buff. *Adult male, winter:* Acquired by complete postnuptial molt. Like corresponding phase of nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to corresponding phase of nuptial adult male, but white tips on lateral rectrices somewhat narrower. Bill dark brown; iris brown; feet slate color. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to corresponding phase of nuptial adult female. *Male and female, first nuptial:* Acquired probably by wear from first winter. Practically same as corresponding sex and phase of nuptial adult. *Male and female, first winter:* Acquired by partial postjuvinal molt. Very similar to first nuptial. *Juvenal:* Acquired by complete postnatal molt. Similar to adults, but pileum more grayish; remaining upper surface, including wing-coverts, much duller, more blended, feathers with mixture of tawny, sometimes feathers with tawny bars and terminal edgings; scapulars with large black spots and tawny or russet edgings or spots; sides of head much duller black; chin mixed with white, buff, and dull black; throat buff; breast paler and more grayish with some vermiculations of tawny and russet, mixed with gray, buff, and dull white. *Natal:* Upper parts vinaceous buff, minutely vermiculated with gray and with small dots and bars of black; lower surface similar but paler, bars spotted with dull black or dark brown, abdomen narrowly barred with fuscous black.

MEASUREMENTS: *Adult male:* Wing, 135.9–152.7 (average, 141.0) mm.; tail, 78.5–95.0 (84.6); bill (exposed culmen), 9.9–14.0 (11.7); tarsus, 16.5–20.1 (18.3); middle toe without claw, 15.5–18.5 (17.0). *Adult female:* Wing, 132.1–144.0 (139.2); tail, 79.0–91.4 (83.3); bill, 9.9–13.5 (11.4); tarsus, 16.0–20.1 (18.3); middle toe, 15.0–17.5 (16.3).

RANGE: S.e. British Columbia to n.w. North Dakota, south to s.e. Arizona and Trans-Pecos Texas. Winters from Chihuahua to Guanajuato; rarely in s. Arizona.

TEXAS: *Breeding:* Altitudinal range, about 1,700 to 8,400 ft. Collected in El Paso (Feb. 29), Hudspeth, Culberson, Presidio, and Brewster cos. Locally common. *Migration:* Collected outside breeding range, southeast to Val Verde Co. Fairly common.

NESTING: *Nest:* On stony mesas, brushy areas, dry barren plains, or edges of woodlands; in slight depression on ground, usually at base of bush, grass clump, or other concealing vegetation; eggs laid on leaves, sometimes on gravel or bare rock, without nest materials. *Eggs:* 2; oval to short elliptical oval; moderately glossy; white with delicate pinkish tinge or pale cream color; unmarked; average size, 26.2 × 20.1 mm.

FROSTED POOR-WILL, *Phalaenoptilus nuttallii nitidus* Brewster

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *P. n. nuttallii* but decidedly smaller; upper parts much lighter and more silvery grayish (less brownish) particularly in light phase; lower surface lighter, more grayish, less brownish.

MEASUREMENTS: *Adult male:* Wing, 129.0–137.4 (average, 133.9) mm.; tail, 77.0–83.6 (82.0); bill (exposed culmen), 9.9–10.9 (10.4); tarsus, 18.0–20.1 (18.8); middle toe without claw, 17.0–18.0 (17.3). *Adult female:* Wing, 134.1–137.9 (135.6); tail, 79.0–86.1 (81.8); bill, 9.4–11.9 (10.7); tarsus, 17.0–19.6 (18.3); middle toe, 15.5–17.5 (16.5).

RANGE: C. Kansas and w. Missouri, south to c. Coahuila and n. Tamaulipas. Winters in s. Texas (casually) and n.e. Mexico.

TEXAS: *Breeding:* Altitudinal range, 200 to about 3,500 ft., probably somewhat higher. Collected north to Armstrong (nesting suspected) and Stonewall (eggs), east to Bosque (nesting suspected), south to Bexar and Starr, west to Val Verde cos. Locally common. *Migration:* Collected northeast to Cooke, south to Nueces (Feb. 27) and Webb, west to Val Verde cos. Additional Feb. specimens from Wichita (perhaps *nitidus*, Feb. 10, 1953, W. W. Dalquest; Midwestern University collection, no. 16614), Kerr (Feb. 21), and Webb (Feb. 16) cos. Fairly common. *Winter:* One specimen (presumably *nitidus*):

Kimble Co. (Dec. 4, 1965, W. W. Dalquest; Midwestern University collection, no. 20035).

NESTING: Similar to that of *P. n. nuttallii*.

PAURAQUE, *Nyctidromus albicollis* (Gmelin)

SPECIES ACCOUNT

Sometimes spelled Parauque; also known as Cuiejo (spelling varies). *Pur-wheeeeer* whistle is unique. This neotropical relative of the Whip-poor-will is the only fully resident U.S. nightjar. Combination of blunt-ended wings with white band across flight feathers (pale buff in female), and long, rounded tail with much white in outer feathers (this reduced in female) is distinctive among U.S. and Mexican goatsuckers; these characteristics show best in flight. Large triangular black spots on scapulars diagnose sitting bird. Eyes shine gold-red in car light (James Fisher). Length, 11½ in.; wingspan, 25; weight, 2¼ oz.

RANGE: Sinaloa and s. Texas, south through Mexico, Central America, and n. South America to Peru, n.e. Argentina, and s. Brazil; also Mexico's Tres Mariás, Mujeres, and Cozumel islands.

TEXAS: (See map.) *Resident*: Breeds, late Mar. to Aug. (eggs, Apr. 1 to June 28; young about 1 week old, Aug. 9) from near sea level to 440 ft.—possibly to 640 ft. Common to fairly common from Laredo, Cotulla, Tilden, George West, Beeville, Rockport, and Aransas Nat. Wildlife Refuge south to mouth of Rio Grande; scarce and local (breeding status unknown) north to Dimmit, Zavala, Frio, Atascosa, Wilson, DeWitt, Goliad, and Refugio (breeding strongly suspected) cos. One specimen record at San Antonio (bird hit by car, Audubon Christmas Bird Count, Dec. 28, 1969, C. R.

Bender; skin in Welder Wildlife Refuge collection).

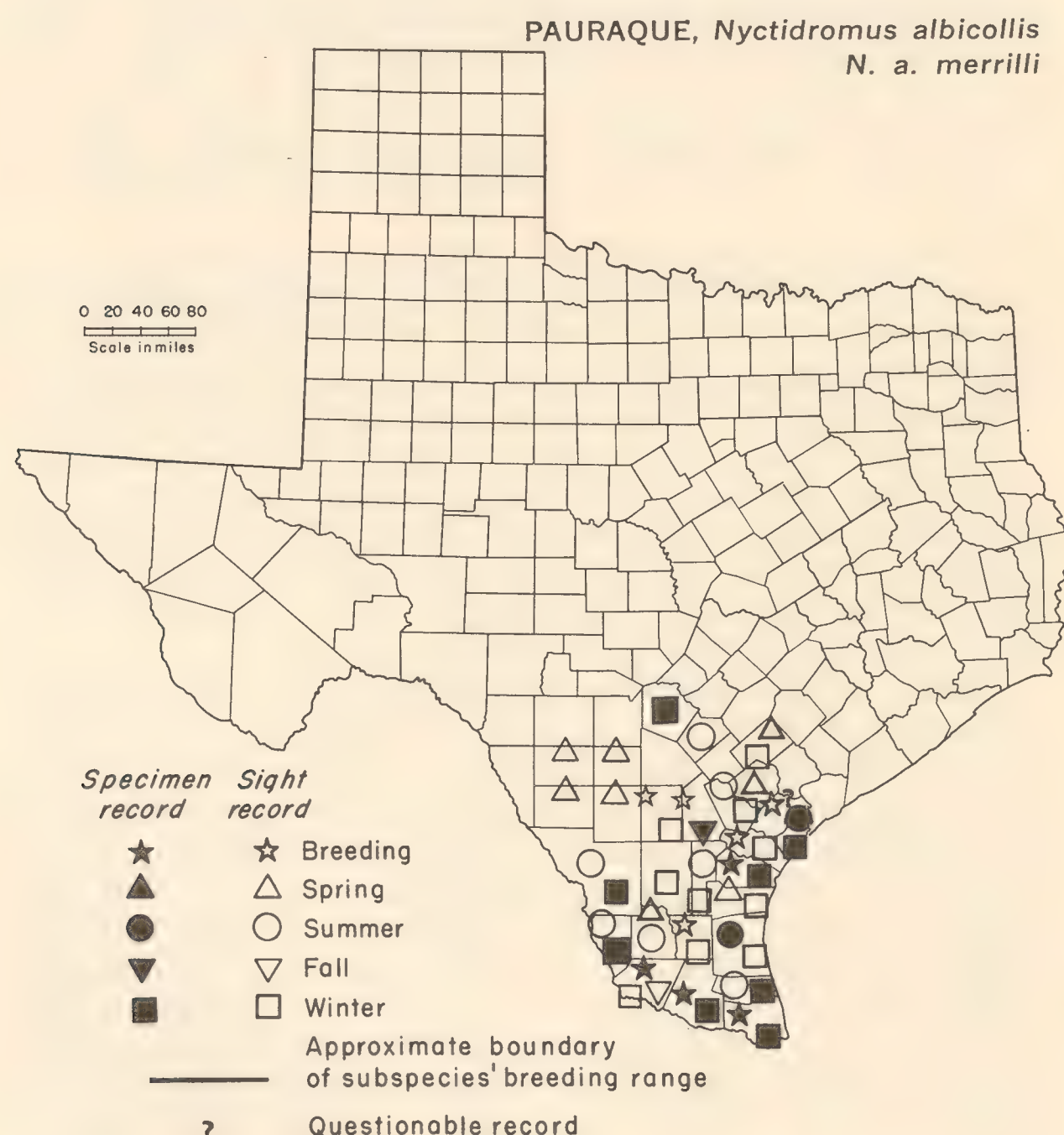
HAUNTS AND HABITS: In hot lowlands throughout continental Latin America the breezy *pur-wheeeeer* of the Pauraque floats across the nighttime countryside; to a naturalist it is one of the great nostalgia-inducing neotropical sounds. Rather oddly, since in South America it appears to live strictly in tropical climate, the present goatsucker resides in virtually all of the Tamaulipan Biotic Province in Texas; this brush country is subject to winter freezes throughout. Resident Pauraque range within the state corresponds almost exactly with the aforementioned biotic province. Distributions of only two other subtropical resident land birds—Long-billed Thrasher and Olive Sparrow—conform neatly to the boundaries of this thornbrush-dotted terrain.

The Pauraque inhabits brush country with openings. In far south Texas it is distributed generally over the landscape, but near its northern limit it lives only along tree- and tall-bush-lined rivers. Prime habitat is nowadays found in patches of mesquite (*Prosopis glandulosa*) and Texas ebony (*Pithecellobium flexicaule*) woods beside the Rio Grande between Laredo and the delta; likewise the nearly one-million-acre mesquite-live oak (*Quercus virginiana*) savannah located on the King Ranch between Kingsville and Raymondville is excellent. Smaller suitable acreages are Bentsen-Rio Grande Valley State Park and three national wildlife refuges: Santa Ana, Laguna Atascosa, and Aransas.

This nocturnal bird typically flies only one to ten feet in the air; when flushed from the ground, it flutters away—like a huge moth—through or under trees and bushes, not over them. Except when it is alarmed, the species is active only in deep twilight or at night. Its chief method of hunting is to jump up from the ground and gulp down low-flying moths, beetles, locusts, bees, and wasps; at times, however, it catches insects during the course of low flight.

In spring and summer, Pauraques frequently engage in behavior that apparently still awaits correct interpretation. On a country road or dusty cow path through brush, two individuals face each other, usually about one to six feet apart. For minutes at a time, the birds flex their short legs (which are, however, longer than those of their immediate relatives), so that their bodies rock up and down in what athletes call "push-ups." Often one or both birds will toss themselves a few feet into the air; at this time the whitish patches in the wings and tail show. Usually no sound comes from the acrobats, or they occasionally utter a few growling or froglike notes. Since the performance takes place in very dim light and any artificial illumination disrupts the action, it is exceedingly difficult for a mere human observer to tell whether the participants are courting or enforcing their territorial rights.

In good calling weather, as evening twilight deepens, Pauraques, perched on the ground, tune up: *pur pur*. A few minutes later, tuning may advance another notch, *pur pur perp*. More moments and a full-blown *pur pur perp pur-wheeeeer* announces that night has



come. On clear nights of full moon during the breeding season, *pur-wheeeeeer* sounds through most of the night. As the dark hours drag on, the hoarse, breezy whistles tend to get faster and faster. By 3:00 A.M. or thereabouts many individuals are spitting out a hard, almost angry-sounding *reer!* The first hint of dawn usually returns the Pauraques to their standard *pur-wheeeeeer*'s. Just at sunup there may be a few *perp*'s and then all is quiet for the day.

Pauraques call frequently from February through July and occasionally during the rest of the year. Various factors can reduce or even largely eliminate vocalization: moonlessness, cold, cloud cover, rain, wind. In addition, birds are mostly silent if they are molting or otherwise in nonbreeding condition; likewise, isolated individuals on the ragged northern edge of the species' range seldom call, probably because there are so few of their fellows to stimulate them. Wherever they are, Pauraques are likely to utter a few *pur*'s or *perp*'s just at dusk; they may or may not sound more notes later.

CHANGES: During the 1960's, some among the ever-increasing hordes of bird watchers in Texas have extended the Pauraque's range northward from Webb and Refugio counties to all of the counties immediately south of the city of San Antonio. At this writing (1971), it is not at all clear whether this is a range extension on the part of the bird or whether more bird watchers have finally learned the secrets of Pauraque-finding. Where the species is rare and local, a would-be finder must listen carefully in the most likely habitat during the critical period when twilight is turning into dark, since Pauraques are located almost entirely by ear. Apparently this fact was not realized until recent years; hence, Pauraques may have been present all along in the brush country immediately south of San Antonio.

DETAILED ACCOUNT: ONE SUBSPECIES

MERRILL'S PAURAQUE, *Nyctidromus albicollis merrilli* Sennett

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts drab or light drab, minutely vermiculated with fuscous and hair brown, crown broadly streaked with dull black, with finer shaft streaks of same; also hindneck, back, and rump with narrow shaft streaks of hair brown; tail light hair brown, drab, or light drab, vermiculated and irregularly barred on four middle feathers with fuscous; outermost tail feather fuscous on outer web and basally barred with cinnamon buff, second and third feathers next to outermost largely white on terminal portions except on outer web of second feather; wing-quills fuscous or olive brown, primaries crossed by broad bar of white, which in places is shaded with buff or pale brown, tips of feathers mottled with pale drab or light drab, inner primaries and secondaries spotted or with irregular mottled bars of cinnamon buff or pale buff, these broadest on inner secondaries; tertials and scapulars drab, very finely vermiculated like upper parts, feathers with large terminal spots of deep black on outer webs, these bordered by pale buff, innermost scapulars mostly clove brown or brownish

black, barred with deep black; wing-coverts drab or hair brown, vermiculated with fuscous or fuscous black, outermost feathers largely fuscous black, all more or less spotted terminally with buff or buffy white; ear-coverts ochraceous tawny or deep ochraceous tawny; lores russet; sides of neck drab, mottled with hair brown, spotted with black, and somewhat washed with buff and tawny; chin deep ochraceous tawny, barred and mottled with fuscous black and buff; broad bar of white across throat; jugulum drab or light drab, barred with fuscous black and sometimes washed with buff or barred with dull ochraceous tawny; remainder of lower parts dull buff or buffy white, narrowly barred with hair brown or fuscous; lining of wing dull ochraceous tawny, mottled with fuscous or clove brown. Bill pinkish brown, but brownish black terminally; iris dark brown or brownish black; legs pinkish gray or light reddish brown; toes darker brown; claws dull brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but white of tail restricted to small terminal area on second and third feathers from outside, and this, with outermost feathers, barred on outer webs for nearly whole length with ochraceous buff; light band across middle of outer primaries narrower and mostly ochraceous buff, instead of white; light throat-band less purely white, more tinged with buff and, therefore, less well defined. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, second winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Male and female, first nuptial:* Acquired apparently by wear from first winter, with which it is practically identical. *Male and female, first winter:* Acquired by partial postjuvenile molt. Similar to adults in winter, but tail feathers narrower, more pointed and duller in color; primaries shorter, tips edged and mottled with buff. *Male, juvenal:* Acquired by complete postnatal molt. Similar to adult male but upper parts paler; crown, back, and scapulars less mottled, more uniform pale drab to drab, scapulars with much smaller and more brownish dark markings; ochraceous color around hindneck more evident; chin and throat mostly buff with a few darker markings; breast darker and duller; legs flesh color; feet light reddish brown. *Female, juvenal:* Acquired by complete postnatal molt. Differs from juvenal male much as do adult male and female. *Natal:* Pileum and nape pinkish buff or light vinaceous buff; back and rump sayal brown; sides of back and of rump between wood brown and fawn color, with broad middle stripe of pinkish buff or light vinaceous buff; upper surface of wings like sides of back; sides of head mikado brown, with broad cinnamon brown stripe involving lores and malar region and extending back under eyes and across auriculars to side of neck; chin and throat light pinkish cinnamon or between cinnamon buff and avellaneous; jugulum, middle of breast, and middle of abdomen pinkish buff.

MEASUREMENTS: *Adult male:* Wing, 173.0–187.5 (average, 182.3) mm.; tail, 168.9–182.6 (176.8); bill (exposed culmen), 11.4–11.9 (11.7); tarsus, 26.9–28.4 (27.7); middle toe without claw, 21.6–22.6 (22.1). *Adult female:* Wing, 164.6–177.5 (170.2); tail, 147.6–155.9 (150.4); bill, 11.4–13.5 (12.7); tarsus, 24.9–26.9 (25.7); middle toe, 20.1–21.6 (20.9).

RANGE: S. Texas, south to s. Tamaulipas. Winters from s. Texas to Puebla and Veracruz (a few).

TEXAS: *Resident:* Collected north to Aransas, south to Cameron, west to Starr (eggs) and Webb cos. One winter specimen from Bexar Co., San Antonio (see species account).

NESTING: *Nest:* In brush, bottomland woods, or on edges of fields; when in more open places, concealed by a bush, usually among scattered bushes and cacti; eggs laid on bare ground without nest material. *Eggs:* 2; rounded oval to elliptical oval, or toward ovate or elliptical ovate; cream buff or salmon buff, sparsely or heavily marked over most of surface with reddish brown and pink, with shell markings of gray, lavender, and ecru drab; average size, 31.2 × 22.6 mm.

Nighthawks: Chordeilidae

COMMON NIGHTHAWK, *Chordeiles minor* (Forster)

SPECIES ACCOUNT

See colorplate 13

Also called Booming Nighthawk. A goatsuckerlike bird (widely regarded as a goatsucker) with long, narrow, pointed wings and notched tail; lacks rictal bristles and brilliant "eye-shine" for which its close relatives are famous. Mainly blackish brown mottled with buffy and grayish brown above; narrowly barred with brownish below; blackish wings with broad, light band (closer to base of primaries than tip). *Male*: throat-crescent, band across wing, and subterminal tail-band pure white. *Female*: throat-crescent whitish; smaller band across wing buffy white; tail-band usually lacking. Length, $9\frac{1}{4}$ in.; wingspan, $22\frac{3}{4}$; weight, $2\frac{3}{4}$ oz.

RANGE: Canada, United States, n. Mexico, Bahamas, and Greater Antilles (West Indian birds often considered separate species, *C. gundlachi*). Winters chiefly in South America from Colombia and Venezuela to Patagonia.

TEXAS: (See map.) *Breeding:* Late Mar. to late Aug. (eggs, Mar. 28 to July 29; young just hatched, Aug. 10) from near sea level to 8,500 ft. Common in most parts, but uncommon in southern Trans-Pecos, northeastern section (north of Huntsville, east of Dallas), and Rio Grande delta. *Migration:* Early and mid-Apr. to late May; early Aug. to late Oct. (extremes: Feb. 27, June 17; July 21, Dec. 8). Very common to fairly common throughout. *Winter:* No specimen, but a scattering of sightings from Dec. 16 to Feb. 4. Casual along coast and in Rio Grande delta. Inland sightings at Dallas (Feb. 4, 1929, C. Kelley) and Little Thicket Nature Sanctuary, San Jacinto Co. (Jan. 7, 1958, J. M. Heiser).

HAUNTS AND HABITS: The Common Nighthawk—in the United States very much a bird of summer—hawks both by night and day over nearly the whole of temperate North America. It lives in open country, clearings, woodland edges, and scattered brushy tracts; it is also frequent about cities and towns where individuals often find convenient nesting places on flat gravel roofs. In localities where both nighthawk species occur, the Common tends to nest at higher altitudes.

Flight of this nighthawk is swift, strong, and very erratic; usually the bird moves quickly in one direction

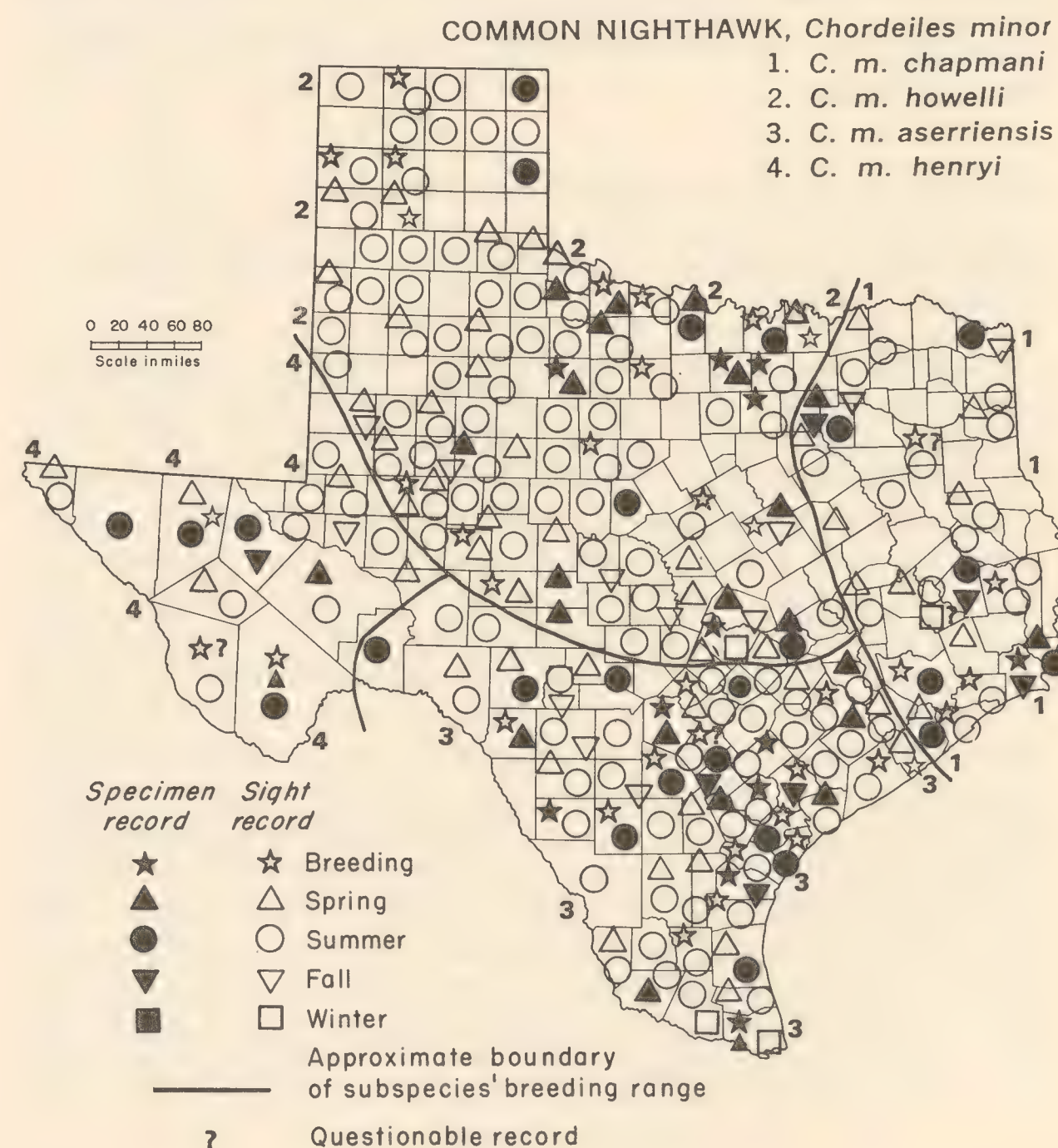
then suddenly changes course, probably in pursuit of insects. In migration, however, it sometimes flies at high altitudes with a succession of wing-beats alternated by periods of soaring. The Common Nighthawk darts high in the air—in contrast to the Lesser which skims at brush-top level—as it chases down large moths, beetles, flies, mosquitoes, locusts, and other winged insects. Although more diurnal than its goatsucker allies, the Common Nighthawk ordinarily remains quiet—perched lengthwise on a cable, tree branch, or rock wall—during the brightest portion of the day.

The loud, grating mid-air call of the Common Nighthawk has been described as an insectlike *peent* or *pee-ik*. During the male's aerial dive, frequently repeated during the springtime breeding season, air rushing through his wings produces a loud, hollow, booming noise.

DETAILED ACCOUNT: EIGHT SUBSPECIES

EASTERN COMMON NIGHTHAWK, *Chordeiles minor minor* (Forster)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by complete or nearly complete prenuptial molt. Upper parts black-



ish clove brown, irregularly spotted with brownish white, cream color, ochraceous buff, and ochraceous, these markings largest on scapulars, which are also much mottled with gray and buff on subterminal unexposed portions, these markings least frequent on pileum and back, which are sometimes almost unmarked; tail grayish clove brown, crossed by seven irregular and broken bars of brownish white, buffy white, and pale brown (these bars whitest on middle pair of rectrices) and by a broad white subterminal band on all but two middle feathers; wing-quills slightly darker than tail, six outer primaries crossed by broad band of pure white posteriorly to tip of ninth primary, outer half of inner webs of secondaries with narrow brownish white or buffy white bars; tertials mottled with light brown, brownish white, or buffy white; upper wing-coverts like quills, most of them irregularly spotted with brownish white and cream buff; broad malar stripe and sides of head and of neck blackish clove brown; sides of neck anteriorly broadly streaked with tawny ochraceous, posteriorly more or less spotted with buff and brownish white, malar stripe spotted with cream buff and white; superciliary stripe consisting of small spots of creamy white anteriorly, cream buff posteriorly; broad crescent on throat, also middle of chin, pure white; jugulum and upper breast grayish sayal brown, former with conspicuous spots of tawny ochraceous and cream buff, latter with spots and irregular or broken bars of cream color and brownish white; rest of lower surface cream buff, heavily barred with dark brown on wing-quills, these bars widest and farthest apart on crissum; lining of wing clove brown, mottled with buffy white or pale buff. Bill black or dark brown; iris black, vandyke brown, or hazel; legs and feet dark brown, brownish slate, dull grayish brown, or plumbeous, sometimes fawn color or dull flesh color; claws black. *Adult male, winter*: Acquired by partial postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by complete or nearly complete prenuptial molt. Similar to nuptial adult male but somewhat smaller; usually lacking broad white subterminal band on tail; white wing-patch smaller and usually more or less mottled with fuscous; light throat-crescent cream buff to tawny ochraceous, instead of white, and often spotted with dark brown; remainder of lower parts much more buffy or ochraceous; crissum rarely, if ever, pure white. *Adult female, winter*: Acquired by partial postnuptial molt. Like nuptial adult female. *Male, first nuptial*: Acquired by complete or nearly complete prenuptial molt. Like nuptial adult male. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to nuptial adult male, but upper surface lighter, pale mottlings much more numerous; white wing speculum smaller, primaries more or less broadly tipped with buff or dull white; tail without subterminal white band; jugulum and upper breast much vermiculated with dull white, pale gray, or dull buff; white throat-patch smaller and less well defined, somewhat creamy or buffy, and much mottled usually all over with dark brown. *Female, first nuptial*: Acquired by complete or nearly complete prenuptial molt. Like nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to nuptial adult female, but upper parts lighter, much more mottled with paler colors; jugulum and upper breast more vermiculated with light color; buff throat-patch much more heavily marked with dark brown, sometimes almost obliterated. Similar to first winter male, but throat usually more deeply buff and more heavily spotted with dark brown. *Juvenal*: Acquired by complete postnatal molt. Similar to corresponding sex in first winter, but usually much lighter above, ground color being paler and light mottlings prevailing; dark areas of lower surface also lighter, bars on posterior lower surface lighter and less distinct; throat-patch not very strongly indicated. *Natal* (this plumage of this race not seen in Texas): Upper parts grayish or buffy white, mottled with mouse gray, drab gray, clove brown, or fawn color with markings of prout brown; lower surface white, creamy white, or pale fawn color; throat mottled with gray, grayish brown, or prout brown.

MEASUREMENTS: *Adult male*: Wing, 183.9–208.0 (average, 198.1) mm.; tail, 105.9–118.1 (110.7); bill (exposed culmen),

6.4–7.6 (6.9); tarsus, 13.5–15.2 (14.2); middle toe without claw, 13.0–15.5 (14.7). *Adult female*: Wing, 187.5–202.9 (196.6); tail, 104.9–118.6 (112.0); bill, 6.4–7.4 (6.9); tarsus, 13.7–15.5 (14.7); middle toe, 14.0–16.5 (15.5).

RANGE: S. Yukon to n. Ontario and Newfoundland, south to n.w. Oregon, n.w. Arkansas, and n. South Carolina. Winters from c. Colombia and c. Venezuela to c. Argentina.

TEXAS: *Migration*: Collected north to Cooke (July 21), east to Orange, southwest to Cameron cos. Uncommon.

NESTING: (This race does not nest in Texas.) *Nest*: On edges of woods, in open woodlands, fields, pastures, burned-over lands, or in cities; no nest material; eggs laid on bare ground, rock, or flat roof. *Eggs*: 1–3, usually 2; elliptical ovate to elliptical oval; somewhat glossy; white or grayish white to olive gray or olive buff; blotched and spotted with various shades of brown and dark gray, slate black, and tawny olive, with shell markings of lilac and purplish gray; average size, 29.9 × 21.9 mm.

FLORIDA COMMON NIGHTHAWK, *Chordeiles minor chapmani* Coues

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *C. m. minor* but decidedly smaller; upper parts averaging a little more mottled and more spotted with dull white or buff, particularly on back, wings, and scapulars; ground color averaging slightly less deeply blackish (more grayish or brownish); posterior lower parts usually more purely white. *Natal*: Probably similar to *C. m. minor*.

MEASUREMENTS: *Adult male*: Wing, 178.1–192.0 (average, 184.2) mm.; tail, 99.1–110.5 (104.9); bill (exposed culmen), 4.8–7.1 (6.4); tarsus, 12.4–15.5 (13.7); middle toe without claw, 13.0–15.7 (14.2). *Adult female*: Wing, 172.5–184.4 (179.3); tail, 99.1–108.5 (103.4); bill, 5.1–7.6 (6.4); tarsus, 13.2–15.0 (14.0); middle toe, 13.7–15.7 (14.2).

RANGE: S.e. Kansas to e. North Carolina, south to s.e. Texas and s. Florida. Winters from n. Colombia to n. Argentina and Uruguay.

TEXAS: *Breeding*: Altitudinal range, near sea level to 550 ft. Collected north to Bowie, south to Orange, west to Brazoria and Harris cos. Common to uncommon. *Migration*: Collected outside breeding range southwest to Victoria, Nueces, and Cameron cos. Common.

NESTING: Similar to that of *C. m. minor*, but average egg size, 28.9 × 20.9 mm.

HOWELL'S COMMON NIGHTHAWK, *Chordeiles minor howelli* Oberholser

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *C. m. minor* but very much paler, more brownish, and more numerously ochraceous and buff marked, particularly on upper surface; lower parts lighter, less blackish, more brownish on anterior portion; breast and abdomen paler and less heavily barred. Differs from *C. m. chapmani* in similar manner; also in much larger size. *Natal*: Probably similar to *C. m. minor*.

MEASUREMENTS: *Adult male*: Wing, 183.9–198.1 (average, 192.0) mm.; tail, 100.1–109.0 (103.1); bill (exposed culmen), 6.9–7.4 (7.1); tarsus, 14.5–15.0 (14.7); middle toe without claw, 14.0–15.5 (14.7). *Adult female*: Wing, 186.2–196.1 (190.2); tail, 103.1–113.0 (108.5); bill, (7.1); tarsus, 14.5–15.0 (14.7); middle toe, 13.5–15.5 (14.2).

RANGE: S.e. Utah to c. Oklahoma, south to n.e. Arizona and c. Texas. Winters probably in South America.

TEXAS: *Breeding*: Altitudinal range, 300 to 4,200 ft. Collected north to Lipscomb, east to Cooke, south to Lee and Travis, west to Kimble and Mitchell cos. Two young found: Oldham Co., Vega (June 24, 1920, A. J. Kirn). Common. *Migration*: Collected north to Wheeler (July 23), east to Kaufman (June 1) and Polk (Aug. 29), south to Starr, west to Brewster and Culberson (June 9) cos. Common.

NESTING: Similar to that of *C. m. minor*, but average egg size, 28.9 × 22.1 mm.

WYOMING COMMON NIGHTHAWK, *Chordeiles minor*
divisus Oberholser, new subspecies (see Appendix A)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. m. howelli*, but upper surface darker and duller, light markings more whitish or grayish (less buffy or ochraceous and usually finer); jugulum and breast of paler buff or more whitish.

MEASUREMENTS: *Adult male:* Wing, 186.2–207.0 (average, 196.3) mm.; tail, 102.6–112.0 (108.2); bill (exposed culmen), 6.1–8.1 (7.4); tarsus, 14.0–15.5 (14.7); middle toe without claw, 13.5–15.0 (14.2). *Adult female:* Wing, 180.1–201.9 (186.4); tail, 101.1–108.0 (105.1); bill, 6.6–7.6 (7.4); tarsus, 14.0–15.5 (14.7); middle toe, 13.5–16.0 (14.5).

TYPE: Adult male, no. 140391, U.S. National Museum, Biological Surveys collection; Loveland, Colorado, July 23, 1895, E. A. Preble, original no., 134.

RANGE: S. Montana, south to n.e. Utah and s. Kansas. Winters probably in South America.

TEXAS: *Migration:* Collected north to Dallas, east to Polk, south to Nueces, west to Culberson (June 9) cos. Uncommon.

CHERRIE'S COMMON NIGHTHAWK, *Chordeiles minor*
aserriensis Cherrie

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. m. howelli* but smaller; rather lighter; upper parts somewhat less brownish (more grayish) with more whitish or grayish (less ochraceous) markings; slightly less buffy posterior lower parts. *Natal:* Probably similar to *C. m. minor*.

MEASUREMENTS: *Adult male:* Wing, 179.1–188.0 (average, 183.6) mm.; tail, 94.5–104.9 (101.3); bill (exposed culmen), 6.1–7.9 (6.9); tarsus, 13.7–15.2 (14.5); middle toe without claw, 13.0–14.7 (13.7). *Adult female:* Wing, 179.1–185.4 (182.9); tail, 98.3–105.9 (102.9); bill, 6.4–7.6 (6.9); tarsus, 13.5–14.7 (14.2); middle toe, 14.0–15.5 (14.2).

RANGE: S. Texas and n. Tamaulipas. Winters probably in South America.

TEXAS: *Breeding:* Altitudinal range, near sea level to 2,200 ft. Collected north to Kerr, east to Austin, south to Cameron, west to Kinney and Terrell cos. Common locally.

NESTING: Similar to that of *C. m. minor*.

SENNETT'S COMMON NIGHTHAWK, *Chordeiles minor*
sennetti Coues

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. m. hesperis* (see below), but upper surface of male lighter and more grayish, dark brown color lighter and more grayish, light markings finer, more numerous, and more grayish or whitish (less ochraceous); general tone of lower surface lighter, dark anterior portions more grayish; bars on posterior parts narrower, sometimes interrupted. *Juvenal:* Upper surface much lighter and more silvery gray than in any other subspecies.

MEASUREMENTS: *Adult male:* Wing, 186.2–213.1 (average, 198.4) mm.; tail, 102.1–112.5 (109.2); bill (exposed culmen), 6.1–7.4 (6.9); tarsus, 13.5–15.7 (14.7); middle toe without claw, 13.7–16.0 (15.2). *Adult female:* Wing, 175.0–200.9 (189.5); tail, 102.6–115.1 (108.0); bill, 6.1–7.6 (6.6); tarsus, 13.7–15.2 (14.7); middle toe, 14.0–16.0 (14.7).

RANGE: S. Saskatchewan, south to s.e. Wyoming and n.w. Iowa. Winters probably in South America.

TEXAS: *Migration:* Collected in Dallas (1 specimen) and Cameron (3) cos. Rare.

WESTERN COMMON NIGHTHAWK, *Chordeiles minor*
henryi Cassin

DESCRIPTION: *Adult male and female, nuptial plumage:* Resembling *C. m. howelli*, but upper surface much darker, markings more tawny and coarser; lower surface posteriorly more buffy, anteriorly more rufescent. Bill black; iris dark brown; feet gray. Similar to *C. m. aserriensis* but decidedly larger; much darker, more brownish (less grayish) on upper surface,

with coarser and much more ochraceous and tawny (less grayish and dull white) light markings; posterior lower surface buffy instead of nearly white; anterior under parts with dark areas more rufescent. *Natal:* Probably similar to *C. m. minor*.

MEASUREMENTS: *Adult male:* Wing, 188.0–209.6 (average, 200.2) mm.; tail, 104.1–116.6 (111.3); bill (exposed culmen), 6.6–7.6 (7.1); tarsus, 13.7–15.7 (14.7); middle toe without claw, 14.0–16.5 (15.0). *Adult female:* Wing, 182.1–198.1 (189.5); tail, 102.6–117.6 (110.0); bill, 6.1–7.6 (6.9); tarsus, 12.4–14.7 (14.2); middle toe, 13.2–16.0 (14.7).

RANGE: S.e. Utah and s.w. Colorado, south through n.w. Mexico to Durango. Winters probably in South America.

TEXAS: *Breeding:* Altitudinal range, 2,000 to 8,500 ft. Collected in Hudspeth, Reeves, Pecos, and Brewster cos. Common to uncommon. *Migration:* Collected northwest to Reeves and Brewster, east to Menard, southeast to Bexar and Cameron cos. Fairly common.

NESTING: *Nest:* In foothills or on mesas or plains; on bare rocky or gravelly land or stony ridges, mostly on dry ground; eggs laid without nest material on ground or rock. *Eggs:* 2; color and markings resembling those of *C. m. minor* but rather paler; average size, 30.5 × 21.9 mm.

PACIFIC COMMON NIGHTHAWK, *Chordeiles minor*
hesperis Grinnell

DESCRIPTION: *Adult male and female, nuptial plumage:* Resembling *C. m. minor*, but male with upper surface lighter, ground color more brownish, light markings more numerous, particularly on back, scapulars, tertials, and superior wing-coverts; posterior lower parts less washed with buffy, and dark bars averaging narrower.

MEASUREMENTS: *Adult male:* Wing, 183.1–211.1 (average, 199.9) mm.; tail, 106.9–119.9 (112.8); bill (exposed culmen), 6.1–8.1 (6.9); tarsus, 13.7–15.2 (14.2); middle toe without claw, 14.0–15.5 (14.7). *Adult female:* Wing, 186.9–202.9 (194.8); tail, 104.9–119.1 (112.3); bill, 6.4–8.1 (7.1); tarsus, 13.0–15.2 (14.5); middle toe, 14.2–16.0 (15.2).

RANGE: S.e. British Columbia to s. Saskatchewan, south to s. California. Winters probably in South America.

TEXAS: *Migration:* Collected north to Dallas, east to Polk, south to Cameron, west to Brown (Aug. 25) cos. Uncommon.

LESSER NIGHTHAWK, *Chordeiles acutipennis*
 (Hermann)

SPECIES ACCOUNT

Also known as Texas Nighthawk and Trilling Nighthawk. Best told by voice (see below). Closely resembles the larger Common Nighthawk, but paler (usually grayer above; browner below); light wing-band (white in male, buffy in female) closer to tip of wing. Flight normally low over ground; not accompanied by booming. Eyes of nighthawks (probably in reference to Lesser) said to reflect cold yellow-green in car headlights (R. T. Peterson). Length, 9 in.; wingspan, 21½; weight, 1¾ oz.

RANGE: Interior c. California to s.w. Texas, south through Mexico and Central America to w. Peru, n. Chile, and s. Brazil; also Venezuela (including Isla Margarita), Trinidad, and Tobago, though absent from most of n.e. South America. Migratory in the north, wintering chiefly from s. Baja California, c. Sinaloa, Guanajuato, and Veracruz to Colombia.

TEXAS: (See map.) *Breeding:* Early Apr. to late July (eggs, Apr. 17 to July 12; young unable to fly,

July 21) from near sea level to about 5,500 ft. Common to fairly common in Trans-Pecos; fairly common from Del Rio, Uvalde, and central coast, south to mouth of Rio Grande; scarce and irregular at Kerrville and San Antonio; casual at Velasco, Brazoria Co. (nest and eggs, June, 1926, C. W. G. Eifrig). *Migration*: Early or mid-Apr. to mid-May; early Aug. to late Oct. (extremes: Mar. 29, June 5; mid-July, Nov. 1). Common through regular breeding range; uncommon on western Edwards Plateau; scarce from San Antonio and Gonzales to Beeville; rare on upper coast; casual in northern Panhandle. *Winter*: No specimen, but careful sightings from Dec. 22 to Jan. 1; no Feb. records. Casual along coast and in Rio Grande delta.

HAUNTS AND HABITS: In low deserts of the Southwest, the weird calls of the Lesser Nighthawk never fail to impress bird listeners. This nighthawk summers in bare or somewhat brushy open country. Here it is found about dry washes and riverbeds, sandy flats, and in broad, rocky, sparsely vegetated valleys; it is far less common in mountains. Trees and brush fringing springs and streams are favorite haunts because of the abundance of insects. In early evening, the Lesser—flitting at times like a huge moth—hawks back and forth among the trees and over the water's surface. In the breeding season it is found singly or in pairs; during migration loose flocks sometimes assemble.

Lesser Nighthawk flight is graceful and buoyant. Usually the bird does not fly at so great a height as does the Common Nighthawk; instead it skims just above the tops of bushes, low trees, or stones on bare ground. More strictly a twilight and night species, it appears less frequently during the day than does the Common. In mid-air, this nighthawk scoops mosquitoes, winged ants, June bugs, and other insects into

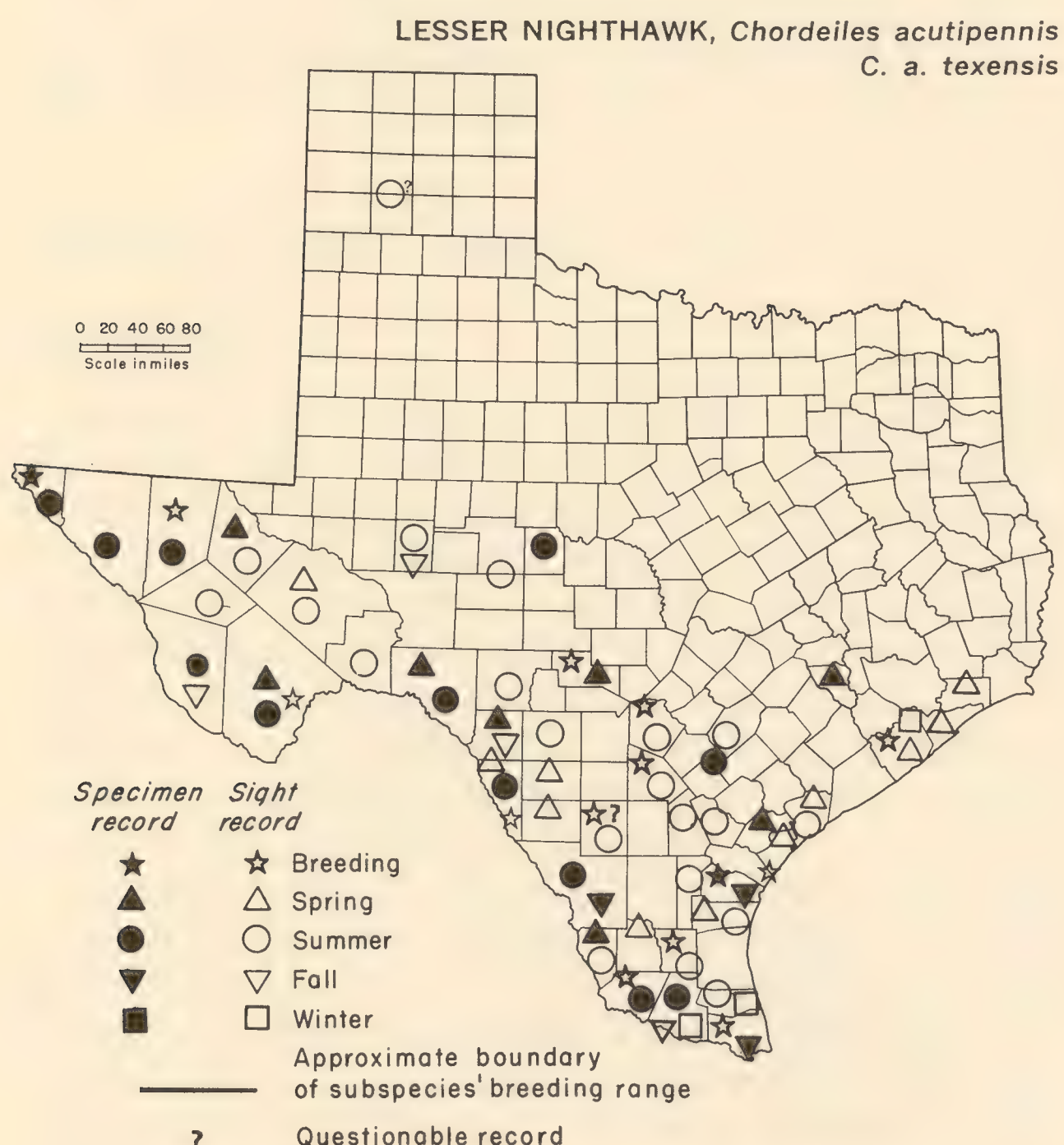
its large mouth; or while at rest on the ground, it bursts up without taking flight to snap up a passing insect.

One note of the Lesser Nighthawk is a soft, slowly repeated *chuck, chuck*. In warm months this bird utters two eerie sounds in addition to various toadlike calls. Most frequent is a single-pitched whinny which resembles that of the eastern Screech Owl but is softer. A sharper vocalization is a winnowing sound reminiscent of the noise made by wind rushing through the tail feathers of a Common Snipe in its display dive. Calls of the Lesser Nighthawk are generally made on the wing; none of them bear the slightest resemblance to any sounds made by the morphologically highly similar Common Nighthawk.

DETAILED ACCOUNT: ONE SUBSPECIES

TEXAS LESSER NIGHTHAWK, *Chordeiles acutipennis texensis* Lawrence

DESCRIPTION: *Adult male, nuptial plumage (gray—normal—phase)*: Acquired by wear from winter plumage. Upper parts light brownish gray, mottled, vermiculated, and irregularly barred with brownish black or fuscous, but pileum nearly all fuscous or fuscous black, scapulars solidly black medially; lower cervix duller and more uniform; tail fuscous, more or less irregularly and rather broadly barred with buff, cream buff, and dull white, these bars above somewhat mottled and broken by fuscous; much broader subterminal bar pure white; wing-quills fuscous, all but outer primaries spotted or barred on both webs with tawny, ochraceous, or buff, and with broad white bar on four outer primaries that is mostly posterior to tip of eighth primary; wing-coverts and tertials mottled, spotted, and vermiculated with white and buff like back; lores and supraocular region mixed with white and blackish brown; auriculars and postocular region blackish brown much mixed with tawny and ochraceous, also with a little white; cheeks, chin, and sides of neck blackish brown, much mingled with white and buff; large triangular patch on throat white; below this a band of dark brown much spotted with ochraceous buff or tawny ochraceous; breast dark brown, finely mottled and vermiculated with white or pale brown; lower breast creamy white with conspicuous fuscous bars; remainder of lower surface buff or dull white with conspicuous fuscous bars, these narrower and farther apart on crissum; lining of wing deep ochraceous buff barred with fuscous. Bill black or brownish black; iris dark brown or bluish black; feet dull flesh color, dull gray, or dull brown. *Adult male, nuptial (ochraceous phase)*: Similar to gray phase, but blackish areas of upper parts somewhat more brownish, light areas mostly tinged with ochraceous or buff; lower parts strongly suffused with ochraceous or tawny; tail-bars more deeply ochraceous. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male in corresponding phase. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male in corresponding phase but smaller; light wing-bar wholly or largely buff instead of white; no white subterminal bar on tail; more white or buff mottling on terminal portion of tail; white throat-patch more or less buffy; lower parts averaging rather more ochraceous. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female in corresponding phase. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding sex and phase of adults in winter. *Male and female, first nuptial*: Acquired by wear from first winter. Similar to corresponding sex and phase of nuptial adults, except primaries, secondaries, and tail feathers have slight buff or dull white tips. *Male and female, first winter*: Acquired by partial postjuvenile molt. Similar to corresponding sex and phase of first nuptial but light tips on



wing-quills and rectrices broader. *Male, juvenal*: Acquired by complete postnatal molt. Similar to nuptial adults, but upper parts more uniform and very much paler, with more ochraceous or gray, and less black; tail and wing-quills broadly tipped with buff; light bars of tail more deeply buffy white; throat-patch much more buffy and well defined; lower surface very pale dull buff or buffy white, barred very narrowly and rather indistinctly with fuscous or fuscous black posteriorly. *Female, juvenal*: Similar to juvenal male, but light spot on primaries smaller and more deeply buff or ochraceous; light throat-patch more deeply buff, never white; tail with no subterminal white bar. *Natal*: Upper surface fawn color, clouded or obscurely mottled with mars brown; lower parts pale fawn color, unmarked, but jugulum darker.

MEASUREMENTS: *Adult male*: Wing, 173.0–192.0 (average, 183.4) mm.; tail, 104.1–119.1 (111.8); bill (exposed culmen), 5.1–6.9 (5.8); tarsus, 13.0–15.0 (14.0); middle toe without claw, 13.0–15.0 (14.2). *Adult female*: Wing, 168.4–180.1

(175.0); tail, 102.1–110.0 (106.1); bill, 5.3–7.1 (6.1); tarsus, 12.4–15.2 (13.5); middle toe, 13.0–15.7 (14.2).

RANGE: C. California to c. Texas, south to s. Sinaloa and e. Veracruz. Winters from Durango through Mexico and Central America to w. Colombia.

TEXAS: *Breeding*: Collected northwest to El Paso and Presidio, east to Kerr and Refugio, south to Cameron cos. *Migration*: Two specimens outside breeding range: Concho Co., 5 mi. north of Eden (June 5, 1932, S. E. Aldous); Austin Co., New Ulm (May 29, 1932, S. E. Aldous).

NESTING: *Nest*: In brush, on lowlands, hills, and in canyons, on dry rocky slopes, and mesas; eggs laid on bare ground, without nest material. *Eggs*: 2; oval to elliptical oval or elliptical ovate; lighter in color and smaller than eggs of Eastern Common Nighthawk, *Chordeiles minor minor*; pale gray to cream white, finely spotted and scrawled with various shades of brown and gray; also with shell markings of lilac ordinarily over entire surface; average size, 26.9 × 19.6 mm.

Swifts: Micropodidae

[BLACK SWIFT, *Nephoecetes niger* (Gmelin)]

Cypseloides niger of A.O.U. check-list, 1957. A large, essentially black swift with a rather long, well-notched (appears square-tipped when broadly fanned), spineless tail; has whitish forehead, lores. Wing-beats normally less rapid and erratic than other U.S. swifts'. Length, 7¼ in.; wingspan, 15; weight, 1½ oz.

RANGE: S.e. Alaska, British Columbia, and s.w. Alberta, south very locally through w. United States and Mexico to mountains of Costa Rica; also West Indies (largely resident in Greater Antilles). Winter range imperfectly known, but continental individuals from northern part of range winter mainly in Mexico and Central America; Lesser Antillean individuals apparently winter in Guyana.

TEXAS: *Hypothetical*: No specimen, but careful sightings over Amarillo (2 birds, Sept. 17, 1959, Peggy Acord; 1 bird, Oct. 18, 1966, Acord; birds seen daily among flock of Chimney Swifts, May 5–10, 1967, Acord, et al.); Blue Creek Canyon in Chisos Mts. (4 or 5 birds, July 22, 1951, J. H. Dick, Alexander Sprunt, Jr.); La Porte, Harris Co. (3 seen in flock of Chimney Swifts and swallows, May 8, 1969, Linda Snyder); and Cove, Chambers Co. (1 bird, Oct. 4, 1949, A. K. McKay).]

CHIMNEY SWIFT, *Chaetura pelagica* (Linnaeus)

SPECIES ACCOUNT

A small, highly aerial bird with flat skull; tiny bill (but wide gape); strong-clawed feet (all 4 toes forward); long, slender, sickle-shaped wings; very short tail with exposed terminal shafts ("spines"). Sooty brown above; paler below, especially on throat. Roger Tory Peterson long ago aptly dubbed it "flying cigar." Length, 5¼ in.; wingspan, 12¼; weight, ¾ oz.

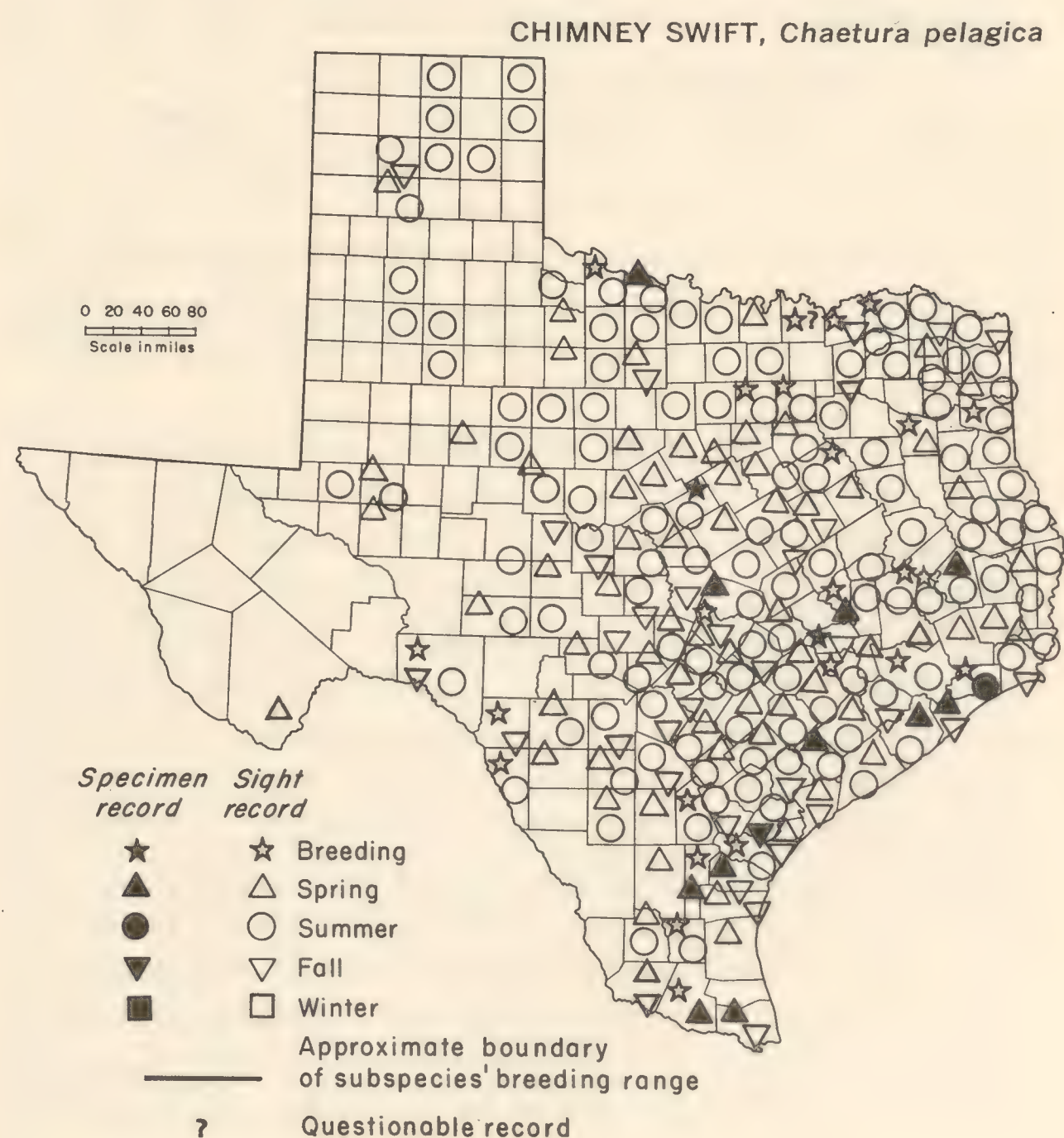
RANGE: S.e. Saskatchewan to Nova Scotia, south to s. Texas, U.S. Gulf coast, and s. Florida. Winters mainly in upper Amazon Basin of n.e. Peru.

TEXAS: (See map.) *Breeding*: Late Apr. to late July (eggs, May 5 to July 5; young in nest to July 15) from near sea level to about 3,700 ft. Abundant to common in most of eastern two-thirds south to 28th parallel; uncommon to scarce south to Hebbronville (nesting suspected) and Falfurrias and west to Amarillo, Lub-

bock, Midland, and Del Rio; rare in Rio Grande delta. *Migration*: Mid- or late Mar. to mid-May; late Aug. to late Oct. (extremes: Feb. 19, June 16; Aug. 14, Nov. 27). Abundant to fairly common through eastern three-quarters; scarce at Big Bend Nat. Park.

HAUNTS AND HABITS: The cosmopolitan swift family contains seventy-nine species, but only one—the Chimney—is abundant and widespread in Texas. The rapid chipping of Chimney Swifts dashing overhead in spring announces two things to a Texan: The listener is somewhere east of El Paso, and the northerners that have pestered him all winter are not going to bite much longer. Flocks of these swifts whirling in the sky or funneling to roost in a chimney are most commonly observed in the neighborhood of dwellings; during spring and particularly fall migrations, these gatherings are especially conspicuous.

Wing motions of the Chimney Swift are similar to those of other species of its family. Flight—the bird often rocking from side to side in the air—is jerky, erratic, and swift. It also glides for a number of feet on extended but motionless, bowed wings. The swift's



way of using its scythelike wings distinguishes it from a swallow which also does insect-catching in the open air. Almost any small airborne fly, ant, beetle, or other insect is readily gulped by the Chimney. Besides feeding on the wing, swifts carry on these additional activities while flying at almost full speed: drinking, bathing, mating, fighting, and snatching twigs (with their feet) off trees for nest material.

These birds are very active late in the day. Often it is almost dark before large, migrating flocks finally descend to roost. Sometimes far into the night individuals will chase moths flitting about floodlights. When going to roost, the birds usually select a tall chimney and circle above for a long time until several birds begin dropping into the stack from the inner portion of the circle. A few at a time continue to disappear until the remaining company almost at once rushes into the roost as though being poured from an immense pitcher. Breeding birds usually occupy a smaller stack; typically there is only one nest per chimney. Sometimes, especially late at night, a pair, which may be joined by the nearly grown young, will fan their wings for many minutes at a time. Resounding from the chimney, this produces a most eerie, low, roaring sound.

The aerial notes of the Chimney Swift are sharp, staccato *chip*'s or *tsik*'s that vary in speed of delivery. A modification heard during the breeding season is a repetition of several isolated *chip*'s followed abruptly by a series of rapid, chattering *chip*'s, then a return to the single notes.

CHANGES: From the 1930's through the 1960's, the Chimney Swift greatly expanded its breeding range within Texas. When *Birds of the Austin Region* by G. F. Simmons was published in 1925, the Chimney Swift was unheard of as a nester in central portions of Texas; however, by 1940 the species was breeding abundantly in the city of Austin. During the 1950's and 1960's, nesting pairs established themselves in San Antonio, Beeville, Corpus Christi, and many other south Texas cities, towns, and villages. In 1966, experienced observer J. C. Arvin reported at least two pairs of Chimney Swifts summering and perhaps nesting in Pharr, Hidalgo County. If these birds really did nest, it would mean that the Chimney Swift had reached the subtropics as a breeder!

It is ironic that in the 1940's and 1950's—during this swift's most vigorous southward expansion—many newspapers and magazines had articles about the climatic warming of the Northern Hemisphere as evidenced, among other things, by the northward expansion of the Tufted Titmouse, Carolina Wren, Cardinal, and other southern birds. Never mentioned was the steady southward advance of the northern-nesting Chimney Swift. At the same time that it was nesting farther and farther south, it was nesting farther and farther west. By the late 1960's, practically all settlements in western Texas except those in the Trans-Pecos had been colonized. However, most houses built since the late 1960's are without fireplaces, or their chimneys are screened; this development may slow or even halt

Chimney Swift advance. In fact, the advance seems already to have stopped as of the early 1970's.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts brownish dark olive gray with somewhat glossy sheen; rump, upper tail-coverts, and tail rather grayish hair brown, spiny projecting tips of shafts of tail feathers dull chaetura black; wings chaetura black, somewhat paler on inner webs, and secondaries and wing-coverts with slight greenish gloss; lores brownish black; chin and throat brownish or grayish white; sides of head and of neck, with breast and abdomen, unmarked dull hair brown, abdomen and crissum darker hair brown; lining of wing fuscous. Bill black or slate black; iris seal brown; legs and feet slate color, drab, grayish black, or brownish black; claws black or slate black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults but somewhat darker above. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults. *First winter:* Acquired by wear from juvenal, with which it is practically identical. *Juvenal:* Acquired by postnatal growth. Similar to adults in winter, but throat duller and less strongly contrasted with remainder of lower surface; feathers softer with slightly darker shaft streaks. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 126.0–133.1 (average, 129.3) mm.; tail, 39.6–43.9 (42.2); bill (exposed culmen), 5.1–6.1 (5.8); tarsus, 11.4–12.4 (11.9); middle toe without claw, 8.1–8.9 (8.4). *Adult female:* Wing, 122.5–133.6 (129.8); tail, 39.9–45.5 (41.9); bill, 5.6–6.1 (5.8); tarsus, 10.9–12.4 (11.7); middle toe, 8.1–8.6 (8.4).

TEXAS: *Breeding:* Collected north to Hamilton, east to Chambers, south to Nueces cos. *Migration:* Collected north to Wichita, east to Polk and Galveston, south to Cameron and Hidalgo cos.

NESTING: *Nest:* In wooded or open regions; formerly in hollow tree, now usually in chimneys of dwellings, in barn silo, cistern, or well; semicircular, shallow bracket of twigs without lining, cemented together and glued to vertical support with saliva of the bird. *Eggs:* 3–6, usually 4–5; ovate to cylindrical ovate; somewhat glossy; white, unmarked; average size, 20.1 × 13.2 mm.

[VAUX'S SWIFT, *Chaetura vauxi* Townsend

Smallest North American swift. Closely resembles Chimney Swift (probably not safely separated in field), but noticeably smaller (in direct comparison) and paler below; rarely nests in chimneys. Length, 4¾ in.; wingspan, 11; weight, ½ oz.

RANGE: S.e. Alaska and British Columbia, south to c. coastal California; also n.e. Mexico and Yucatán Peninsula (including Isla Cozumel), south locally through e. and s. Mexico to Panama; also in Venezuela. U.S. race migratory, wintering mainly from s. Mexico to Panama; rarely north to c. California and s. Louisiana.

TEXAS: *Hypothetical:* Reported from Sept. 18 to May 8. Fall sightings: Lampasas Co. (flock going down a chimney, Sept. 19, 1952, J. W. Aldrich); McLennan Co., Waco (flock, Sept. 18, 1952, Aldrich). Winter sightings: Brazos Co., Bryan (Dec., 1938, Mary McInnis); Harris Co. (Feb. 12, 1914, R. A. Selle; Feb., 1928, Bessie Reid); Jefferson Co. (Jan. 6, 1926; Feb., 1927; Jan. 27, 1933; Jan. 26, 1936; Jan. 17, 1937; 26

seen on Dec. 25, 1940, Reid); Calhoun Co., Port O'Connor (7 taken from a stovepipe, Dec. 20, 1910, R. D. Frazier). Spring sighting: Nueces Co., Corpus Christi (May 6, 7, 8, 1946, F. M. Packard). Any small, spine-tailed swift seen in Texas between Dec. and Feb.—however unlikely—is presumably this species, but further substantiation is needed.]

WHITE-THROATED SWIFT, *Aeronautes saxatalis* (Woodhouse)

SPECIES ACCOUNT

The only boldly patterned U.S. swift. Mostly dull black with white throat, breast, median belly, and flank-patch; white-tipped secondaries; longish, deeply notched tail without exposed terminal shafts. Length, 6¼ in.; wingspan, 13½; weight, 1¼ oz.

RANGE: S. British Columbia to w. South Dakota, south—chiefly in mountains and somewhat locally—to Guatemala and El Salvador. Migratory in north, wintering mainly in s.w. United States and Mexico.

TEXAS: (See map.) *Breeding:* Probably early May to mid-July. Regularly common to fairly common in summer in Trans-Pecos mountains from about 2,400 to 8,500 ft. Actual nesting evidence scarce, due primarily to inaccessibility of sites (nesting colony, south side of Emory Peak, Chisos Mts., May, 1932, G. M. Sutton, J. Van Tyne; feeding young, Pine Canyon, Chisos Mts., first 3 weeks of June, 1901, H. C. Oberholser; young begging, Santa Elena Canyon, ca. 10 mi. west of Chisos Mts., June 25–July 3, 1901, Oberholser; nesting colony near El Paso, southeast cliffs of North Franklin Peak, Franklin Mts., 1920's–1930's, A. H. McLellan;

nesting colonies, Guadalupe Mts., late 1930's, T. D. Burleigh, G. H. Lowery, Jr.; colonies, Guadalupe Mts., 1960's, F. R. Gehlbach). *Migration:* Early Mar. to early May; early Sept. to late Nov. Common to uncommon through much of Trans-Pecos; rare in western Panhandle; casual (most in spring) at Coleman, Austin, and in coastal vicinities from Houston to Corpus Christi. *Winter:* Dec. to Feb. Fairly common in Chisos Mts.; scarce to rare in remainder of Trans-Pecos.

HAUNTS AND HABITS: About rocky peaks of the West, White-throated Swifts whizz and whine like bullets; these most handsome U.S. swifts can make mountain climbing in Trans-Pecos Texas quite startling! Santa Elena Canyon in Big Bend National Park is a typical haunt. Within this narrow rock gorge, the Whitethroat is often the most numerous bird as it darts and swirls, singly or in small companies, about the canyon walls.

Of the four U.S. swifts—Black, Chimney, Vaux's, and White-throated—the present species is regarded as the swiftest flier. Considering Americans' fondness for superlatives, it is strange that no one has accurately measured the Whitethroat's speed, but observers on several occasions have seen it escape from a Peregrine Falcon stooping at an estimated velocity of slightly more than 200 m.p.h. Erratic dashes with rapid, flickering wing-beats alternate with periods of sailing on extended wings; occasionally wing-tips are swept back so that the bird resembles a flying arrowhead. In mid-air, this swift devours flies, winged ants, beetles, bees, wasps, and other flying insects. During the day it is rarely seen except on the wing, save for an occasional glimpse as it clings to a precipice or pauses at the entrance of a rocky crevice. Adapted for rock climbing, the strong- and long-clawed toes on its practically non-existent legs are of little use for walking or perching.

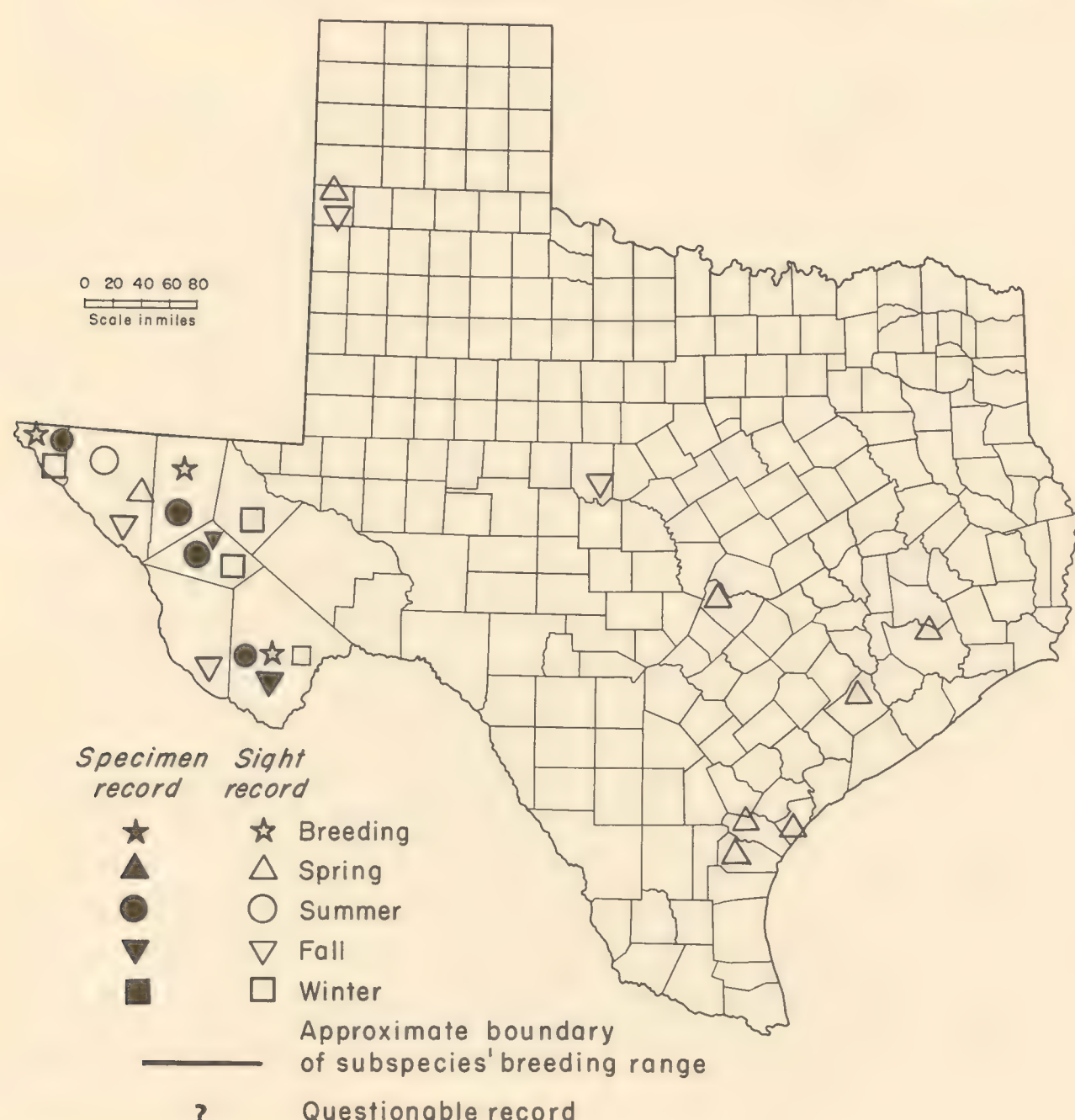
Shrill *jejejejejeje*'s of the White-throated Swift fall from the sky as the bird circles above, often so high as to be invisible; these notes are harsher and louder than the chippers of the Chimney Swift. In rocky crevices it utters soft twitters.

DETAILED ACCOUNT: TWO SUBSPECIES

COMMON WHITE-THROATED SWIFT, *Aeronautes saxatalis saxatalis* (Woodhouse)

DESCRIPTION: *Adults, nuptial plumage:* Acquired probably by partial prenuptial molt. Pileum and hindneck fuscous or light fuscous, paler on forehead; remainder of upper surface fuscous black, upper surface of body more or less shiny; tail chaetura black with slight metallic greenish gloss; wing-quills fuscous, paler on inner margins, and secondaries broadly tipped with white, wing-coverts like back; sides of head anteriorly brownish white; spot in front of eye dark brown; cheeks white; sides of neck and of posterior part of head light fuscous; chin, throat, jugulum, middle of breast, abdomen, and flanks pure white; sides of breast and of body and lower tail-coverts fuscous black with slight gloss. Bill black; bare eyelids sepia; iris dark bistre; legs and feet light dull pink; interior of mouth flesh color. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like adults in winter. *First nuptial:* Acquired by wear from first winter. Similar to nuptial adults, but pileum more brownish (less blackish) than back; forehead decidedly paler than crown. *First winter:* Acquired by partial postjuvinal

WHITE-THROATED SWIFT, *Aeronautes saxatalis*
A. s. saxatalis



molt. Practically identical with first nuptial male and female. *Juvenal*: Acquired by postnatal growth. Similar to nuptial adults, but upper parts lighter, duller, and more brownish, pileum and hindneck conspicuously paler than rest of upper surface; tips of secondaries very pale brown or brownish white; sides of neck paler; chin, throat, and middle of abdomen pale brown or brownish white; dark areas of lower surface duller, lighter, and more brownish than in adult. Bill black; iris mars brown; legs and feet pale purplish vinaceous; claws black. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 129.5–139.4 (average, 135.6) mm.; tail, 53.1–58.9 (57.2); bill (exposed culmen), 5.1–6.6 (5.8); tarsus, 9.4–11.4 (10.2). *Adult female*: Wing, 132.1–145.0 (138.2); tail, 52.1–62.0 (56.6); bill, 5.3–6.6 (5.8); tarsus, 8.9–10.9 (10.2).

RANGE: N. California to n. New Mexico, south to s. Baja California, Sonora, and s. Tamaulipas. Winters from c. California to s. central Mexico.

TEXAS: *Breeding*: Collected in El Paso, Culberson, Jeff Davis, and Brewster cos. *Migration*: No specimen taken outside breeding range.

NESTING: *Nest*: In cliffs of canyons or mountains, occasionally stone walls of buildings, small caves or crevices on face of cliffs

or walls of buildings, usually very difficult to reach; a bracket of weed stalks, grasses, feathers, bark, vegetable down, wool, and wing-shields of beetles, glued together and to side of cliff with saliva of the bird; lined with feathers and fine bark fibers. *Eggs*: 2–6, usually 4 or 5; elongate ovate to cylindrical ovate or elliptical; pure white, unmarked; average size, 21.6 × 13.0 mm.

IDAHO WHITE-THROATED SWIFT, *Aeronautes saxatalis sclateri* Rogers

DESCRIPTION: *Adults, nuptial plumage*: Similar to *A. s. saxatalis* but decidedly larger; upper surface, particularly head, somewhat darker.

MEASUREMENTS: *Adult male*: Wing, 140.0–151.9 (average, 145.3) mm.; tail, 58.4–64.0 (61.0); bill (exposed culmen), 6.1–6.6 (6.4); tarsus, 9.9–11.4 (10.4). *Adult female*: Wing, 140.0–151.1 (144.3); tail, 56.9–63.0 (59.2); bill, 5.8–6.6 (6.4); tarsus, 9.4–10.4 (9.9).

RANGE: S. British Columbia to n. Montana, south to e. Oregon, s. Colorado, and w. Nebraska. Winters probably in Mexico.

TEXAS: *Migration*: Three specimens: Jeff Davis Co., Davis Mts., about 7,000 ft. (2 on Oct. 5, 1916, A. P. Smith); Brewster Co., Marathon (Oct. 24, 1936, T. D. Burleigh).

Hummingbirds: Trochilidae

GREEN VIOLET-EARED HUMMINGBIRD, *Colibri thalassinus* (Swainson)

SPECIES ACCOUNT

Also called Green Violetear, Mexican Violetear (northern race), and simply Violetear. A large hummingbird (in comparison with Rubythroat) with rather short, slightly decurved dull black bill. *C. t. thalassinus* of Mexico and Guatemala: *Male*: mainly iridescent bronzy green with broad metallic bluish violet streak on each side of face from lores through ear-coverts and another patch of same color in center of breast; ample bluish green tail with blue-black or dusky subterminal band; crissum grayish with buff edges on feathers. *Female*: similar but duller; bluish violet chest-patch usually reduced in size and intensity. *Immature*: feathers often edged with pale gray. Length, 4½ in.

RANGE: Highlands of c. and s. Mexico from Jalisco, Michoacán, Morelos, s.e. San Luis Potosí, and Veracruz, south through Central America to Peru and Bolivia. Generally withdraws to lower altitudes during dry season.

TEXAS: *Accidental*: Three, possibly four, sightings of single birds; one documented with excellent photographs:

Travis Co., edge of Edwards Plateau between Austin and Oak Hill, yard of Ken and Nila Copeland (1 observed with Rubythroats, Aug. 25–Sept. 18, 1969, by approximately 100 Texas bird watchers and at least 1 observer from New York, Joe W. Taylor, who jetted to Austin especially to see the bird; photographed by Nila Copeland, et al., and painted by artists Jo Alys Downs and Nancy McGowan). Larger-than-life-size color photo by John Suhrstedt reproduced in *Texas Parks & Wildlife*, vol. 27 (Nov., 1969), on inside back cover. This magazine picture subsequently confirmed as illustrating *Colibri thalassinus* by John W. Aldrich and Alexander Wetmore, who compared photo with specimens in the U.S. National Museum. At the Chicago Natural History Museum, Emmet Reid Blake and Dorothy Cooper Hartshorne matched copious field notes and sketches with Green Violetear specimens from Mexico and Guatemala. On Aug. 27, 1969, Bertha McKee Dobie saw “a large dark hummingbird about twice the size of a Rubythroat” in her ceniza—the *Leucophyllum* bush of Texas and Mexico—at 702 Park Place, Austin.

Hidalgo Co., heavy brush near Rio Grande in Santa Ana Nat. Wildlife Refuge (lone bird present, July 11–28, 1961, R. J. Fleetwood, observed also by L. I. Davis, C. E. Hudson, Jr., and E. B. Kincaid, Jr.). Identity of bird concluded in 1964 by Fleetwood after he had watched another Green Violetear near San Benito.

Cameron Co., 3 mi. south of San Benito (1 bird feeding with Rubythroats on flowering shrubs, Apr. 14, 1964, carefully studied in good light for over 25 minutes by two experts, Fleetwood and C. E. Hudson, Jr.; for details, see *Southwestern Naturalist* 10 [1965]: 312).

The suggestion, of course, has been made that the three, perhaps four, individuals of *Colibri thalassinus* seen in Texas were escaped cage birds. However, unlike parrots and finches, hummingbirds have never been popular captives. Texans much prefer to hang a bottle of red sugar water outside a window and watch wild hummers come to it. None of the few Texas zoos that keep hummingbirds reported any of their charges missing at or near the various times and places of the Violetear sightings. Texas birds were healthy, smooth feathered, without leg-bands, and otherwise showed no signs of having been held in captivity. Detailed studies by H. O. Wagner in the vicinity of Mexico City and by A. F. Skutch in Guatemala and Costa Rica have shown that the species is strongly migratory in habit. It nests where nectar-bearing mountain flowers are at their peak and then it disperses, chiefly in late summer and fall, to lower altitudes. In theory, at least, it would be relatively easy for the nomadic *C. thalassinus* to be enticed into the United States by fall-blooming Turk's cap (*Malvaviscus*) and other blossoming shrubs which grow on both sides of the Texas-Mexico border. Torrential rains and flooding in central and southern Mexico in late summer 1969 conceivably could have displaced some birds northward in that year.

HAUNTS AND HABITS: *Colibri thalassinus* is primarily a highland hummingbird. Chiefly from 5,000 to 11,000 feet it is to be found about profusely flowering plants (*Salvia*, *Phaseolus*, *Cirsium*, *Cuphea*, others) in openings or edges of conifer or mixed forests—fir-pine-oak in Mexico; cypress (*Cupressus Benthamii*) in Guatemala. It also occurs in shady gardens and pastures, even in intensely cultivated areas. Observers in Mexico and Texas have noted that the Green Violetear often keeps to the dimly lit interior of thickets—where the

bird appears black. The nest, apparently variable according to race, is either a broad, moss-and-cobweb cup, decorated on the exterior with a few dried leaves and placed in a horizontal lower branch of a small tree (e.g., cypress sapling); or a cup of grass, ferns, and/or moss, usually sans ornamentation, secured to a down-drooping plant stem, vine, or hanging root. Which ever, it is low—generally about 1½ to 6 feet above the ground. Two elongated white eggs, standard for hummingbirds, are laid in the nest.

Seasonal movements of the Green Violetear are governed by blooming of nectar-providing flowers. The species breeds during the rainy season—July through September in Mexico—when blossoms are abundant. Female Violetears are reclusive nesters and tend to abandon sites under too close and obvious scrutiny. The hardy nestlings withstand great temperature changes from frosty nights to intensely sunny or rainy days. They are fed nectar and some tiny insects and spiders regurgitated by the female—a diet similar to that consumed by the adults.

A singing male usually perches on an exposed dead twig, fifteen to forty feet above the ground, although some birds sing from lower, more secluded branches in bushes. During the nesting season, he tirelessly sounds his metallic *k'chink chink k'chinky chink's* from sunup to sundown. The individual photographed in Texas made clackety sounds suggesting those of a Roadrunner.

NOTE: Even though Suhrstedt's photograph of the Austin-Oak Hill, Texas, Green Violetear is detailed enough to show individual body feathers, it is still probably unwise to diagnose subspecies from photographs or field notes. Several on-the-spot observers agreed, however, that the photographed bird matched the adult male plumage of Green Violetears that they had seen in the mountains surrounding the Valley of México.

LUCIFER HUMMINGBIRD, *Calothorax lucifer* (Swainson)

SPECIES ACCOUNT

Has decurved bill. *Male*: metallic bronze green above with dull white spot back of eye; flashes elongated purple gorget of shaggy feathers; whitish below with rusty sides; deeply forked, blackish tail. *Female*: similar but lacks gorget; has uniform buff under parts; slightly notched, white-cornered tail with rufous at base of outer feathers. Length, 3½ in.

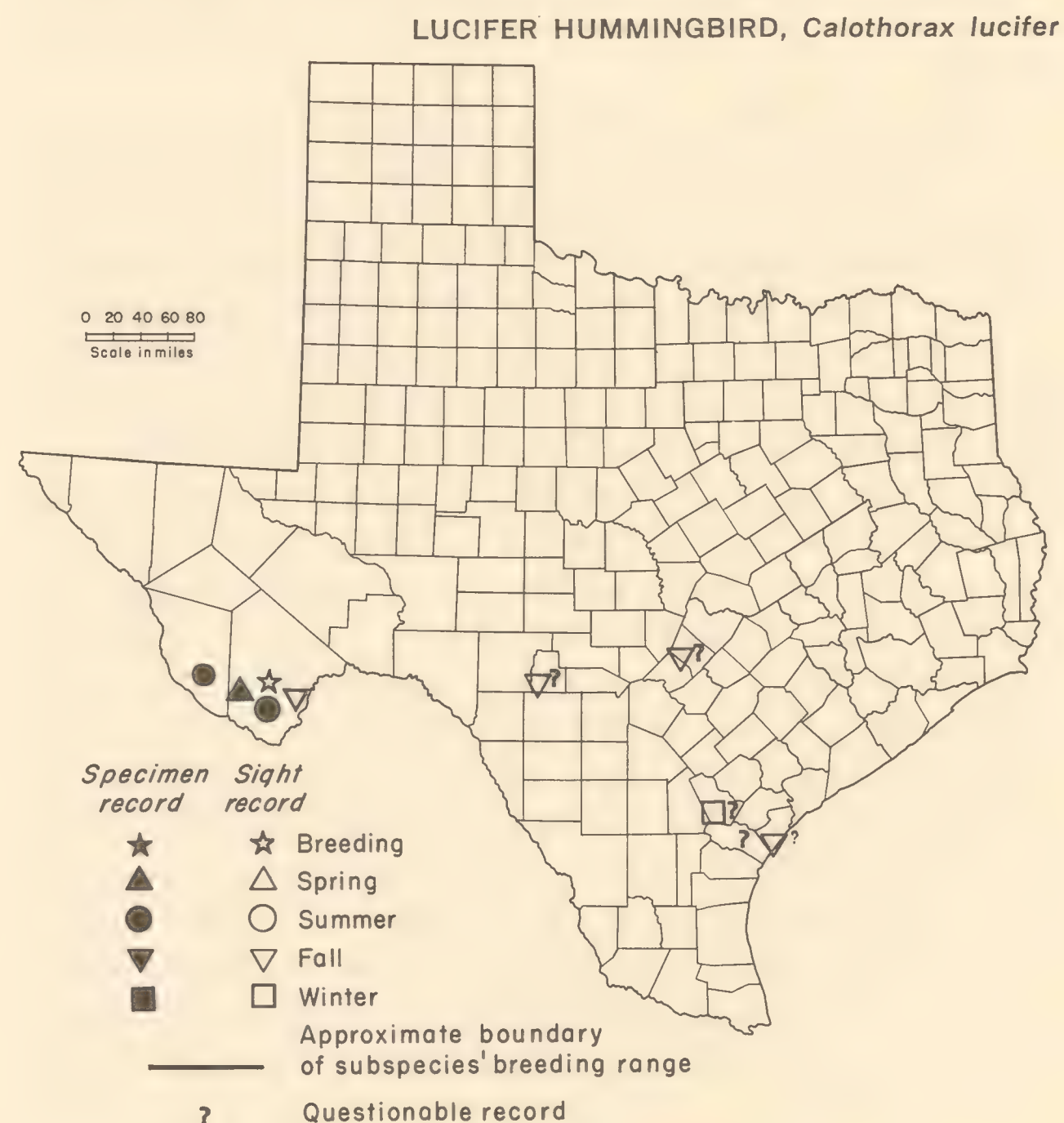
RANGE: Trans-Pecos Texas, south to Chiapas. Casual visitor to s. Arizona. Winters in Mexico.

TEXAS: (See map.) *Breeding*: Summers from Mar. 7 to Nov. 10, but actual nesting records scarce (nest located, beside Chisos Basin campground, 5,000 ft., May 18, 1968, R. C. Nelson; nest, near Terlingua, 2,720 ft., July 13, 1962, Robert Pulich, W. M. Pulich, Sr.; very young birds, barely able to fly at feeder, Panther Junc-

tion, 3,800 ft., first week of Aug., 1969, R. H. Wauer). Fairly common (regarded as uncommon to rare prior to 1960) in southern Big Bend (Presidio and Brewster cos.). *Vagrant*: Two Edwards Plateau sightings: Real Co., Prade Ranch (subadult male, Sept. 12, 1962, Clinton Snyder, Linda Snyder); Hays Co., Wimberley (female, Oct. 4, 1962, Hazel Greene). Also reported seen on central coast: Aransas Co., Rockport (present, fall of 1957, Connie Hagar); Bee Co., Beeville (female or immature found after freeze, Jan. 4, 1959, fide Hagar).

HAUNTS AND HABITS: *Calothorax lucifer*—whose sober scientific name can be translated as “beautiful-breasted light-bearer”—is a glittering member of the 319-species-strong Trochilidae. Among the 14 regular U.S. hummers it is unique on four counts: The Lucifer has a decurved bill (which imparts an especially sphinx moth-like shape), the female is readily identifiable in the field both as to species and sex, the bird is a border-hugger which is more numerous in Texas than in Arizona, and it is increasing and extending its range in Texas. The Lucifer Hummingbird is an inhabitant of elevated arid land; it is most at home amid scattered century plants (*Agave*) on high, almost treeless deserts from the vicinity of México City to Texas' Big Bend. Like hummers in general, the Lucifer spends most of its waking hours in the air. However, when the female is shaping her nest and incubating the two eggs, she is less frequently on the wing; after the young hatch, she puts in a tremendous amount of flying time while gathering food for her rapidly growing brood.

Only a small percentage of the Lucifer population leaves its Mexican desert range to nest in Trans-Pecos Texas. During March and April some males, followed a few days later by their females, hum—whirr is a better term—north to rocky desert peaks along the



great Bend of the Rio Grande. Migration flight speed is usually near 20 m.p.h. On gauzelike wings the birds buzz to, hover before, probe with their bills, and then back away from spring flowers, such as the Chisos blue-bonnet (*Lupinus havardii*) and the scarlet-blossomed ocotillo (*Fouquieria splendens*). During the course of the hummer's day it sips much nectar from flowers and catches tiny insects (frequently gnats and small flies) in the air; beelike, the bird also fertilizes plants by transporting pollen on its bill and forehead to the flowers it visits. When they are in bloom—from May through September—brilliant yellow-green blossoms of century plants (especially *Agave americana*, *A. chi-soensis*, *A. havardiana*, and *A. lecheguilla*) are overwhelming favorites of the Lucifer. One or two of these birds can often be found at each flowering century plant, according to park naturalist R. H. Wauer who has studied and reported seasonal movement of this species within Big Bend National Park. After nesting in May, June, and early July on the open desert or on Chisos Mountain slopes up to 5,000 feet, individuals during late July and early August drift up to the high canyons, especially Boot Canyon at 6,300 feet. In late August these highlanders begin moving into lower canyons where they stay until about the second week of September. From late September to November most individuals fly to their winter territories; the few that remain probe the yellow tubular flowers of tree tobacco (*Nicotiana glauca*) along the Rio Grande. By about November 11, all proper Lucifer Hummingbirds have returned to Mexico where they remain until early March when rising hormones urge them north again.

In normal flight, the very rapidly beating wings (50 or more beats per second) of the Lucifer and other hummers produce a steady humming, whirring, or buzzing sound. Shrill squeaks come from the bird's voice box, the syrinx.

CHANGES: With practically every beautiful form of life in the world going downhill, it is a joy to report one which is increasing, even if only locally and at a very moderate rate. Prior to 1960, none of the many Big Bend bird observers seemed to rate the Lucifer Hummingbird more than uncommon and most termed it rare.

In *Birds of the Big Bend National Park and Vicinity*, R. H. Wauer writes of his experience with the Lucifer during the 1960's: "This species previously has been considered to be quite rare within the Big Bend, the only place within the United States where it has been recorded regularly. However, it can be quite numerous. In May, except for the Black-chinned Hummer on the floodplain, it may be the most commonly seen hummingbird from the Rio Grande to the highest slopes of the Chisos Mountains."

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts rather dull metallic bronze, bronzy green, or golden green, somewhat duller on forehead; tail feathers lengthened, relatively narrow, and

pointed, four middle feathers like back; remainder of tail dark purplish brown or dull black; wing-quills fuscous with more or less purplish sheen, anterior wing-coverts metallic green like back; small spot on side of head behind eye dull white or buffy white; chin and throat brilliant metallic solferino or magenta with violet sheen; metallic lateral feathers of throat elongated; jugulum and sides of neck dull white or buffy white; sides and flanks metallic olive green mixed with light cinnamon; middle portion of breast and of abdomen dull pale gray or grayish white; under tail-coverts grayish or buffy white, shaft areas darker. Bill dull black; iris dark brown; feet dull brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male but slightly duller. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but wing longer, tail shorter; lateral rectrices much broader, three outermost with basal portion light cinnamon rufous, broad subterminal portion purplish black, two outermost tipped with white, second and third feathers with black area separated from rufous by space of metallic brownish green, fourth rectrix mostly metallic green but terminal portion blackish and outer web margined basally with light cinnamon rufous; upper parts lighter, more bronzy (less bluish) green; postocular streak (instead of spot) dull white or buffy white; cheeks and lower surface light vinaceous cinnamon or cinnamon buff; middle of abdomen dull buffy white; under tail-coverts sometimes dull white, flank-tufts white. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial:* Acquired probably by complete prenuptial molt. Like nuptial adult male above, like nuptial female below; throat with scattered solferino feathers. *Male, first winter:* Acquired by partial postjuvenile molt. Similar to nuptial adult female including broader tail feathers, but darker above and below, size smaller; throat with some metallic purple feathers. *Female, first nuptial:* Not seen, but acquired probably by complete prenuptial molt. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to nuptial adult female. *Male, juvenal:* Acquired by postnatal growth. Not seen, but probably similar to first winter female. *Female, juvenal:* Acquired by postnatal growth. Although not seen, probably similar to first winter female, but bill shorter; upper parts duller with cinnamon edgings broader. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 36.1–39.1 (average, 37.8) mm.; tail, 26.9–31.0 (28.7); bill (exposed culmen), 19.0–22.1 (20.9). *Adult female:* Wing, 39.1–43.9 (41.1); tail, 23.9–28.9 (25.1); bill, 20.1–22.6 (21.4).

TEXAS: *Breeding:* Collected in summer in Presidio and Brewster cos. (see species account). Following specimens show low and high collection points in each county: Presidio Co.: 12 mi. east of Ruidosa, 5,000 ft. (female, Aug. 7, 1941, O. J. Erlund); Chinati Peak, 7,730 ft. (female, Aug. 14, 1941, J. L. Robertson); both skins in Texas A&M University collection. Brewster Co.: bank of Rio Grande 3 mi. west of Boquillas, about 1,900 ft. (adult female, May 17, 1935, G. M. Sutton); Chisos Mts., Pine Canyon, 5,900 ft. (immature male, June 6, 1901, H. C. Oberholser; adult male and female, June 7, 1901, L. A. Fuertes).

NESTING: *Nest:* In mountains, valleys, or deserts; usually in bush or on an agave bloom stalk, a few feet above ground; small cup of thistle and other vegetable down and fibers; bud scales and blossoms fastened on outside by spider webs and ornamented sometimes with lichens; lined with similar materials. *Eggs:* 2; elliptical ovate; white, unmarked; average size, 12.7 × 9.7 mm.

[ANTILLEAN CRESTED HUMMINGBIRD, *Orthorhyncus cristatus* (Linnaeus)]

Male: glittery green above; conspicuous pointed crest, color variable according to race—metallic green in *exilis* of e. Puerto Rico south to n. Lesser Antilles

(green and blue to violet blue in other races); dark gray to blackish wings, tail, and under parts. *Female*: often has crest; green above with blackish on wings; pale grayish or whitish below; white tips on outer tail feathers. Length, 3½ in.

RANGE: Extreme e. Puerto Rico, eastward to Vieques, Culebra, Virgin Islands, and Lesser Antilles.

TEXAS: *Hypothetical*: One specimen, first record for the United States: Galveston Co., Galveston Island (1 bird netted by 2 boys, names unknown, Feb. 1, 1967; damaged remains retrieved from trash can by request of Starling Mosley, identified to species by Warren M. Pulich, Sr.). Pulich sent skin to American Museum of Natural History, where it was identified as the subspecies *exilis* by Wesley E. Lanyon and Eugene Eisenmann. Specimen now bears catalog no. AMNH 788639. For details see Pulich, 1968, *Auk* 85: 322.

While there can be no doubt as to the identification of this specimen, the true origin of the Texas individual remains obscure. The boys, who refused to give their names, claimed they netted the bird alive on Galveston Island, Feb. 1, 1967, but would not relate any further details of the capture. For the Antillean Crested Hummingbird to have occurred naturally on Galveston Island, a continental island, it would have had to fly more than one thousand miles across the Caribbean Sea and Gulf of Mexico. This species is a sedentary endemic of small tropical islands; during daylight hours it has to feed on flower nectar, insects, and spiders every few minutes in order to stay alive. It is not unheard of for tropical birds to fly northwest in winter, but it doesn't happen very often. Dispersal by hurricane can be ruled out because there was none for several months preceding and following the Feb. 1 capture. The simplest explanation of the occurrence is that some military person or tourist brought this very attractive hummer, either alive or dead, to the Houston-Galveston area, the largest sea and air port of the western Gulf of Mexico region. All theories of arrival are speculative; the species should remain on the hypothetical list.]

RUBY-THROATED HUMMINGBIRD, *Archilochus colubris* (Linnaeus)

SPECIES ACCOUNT

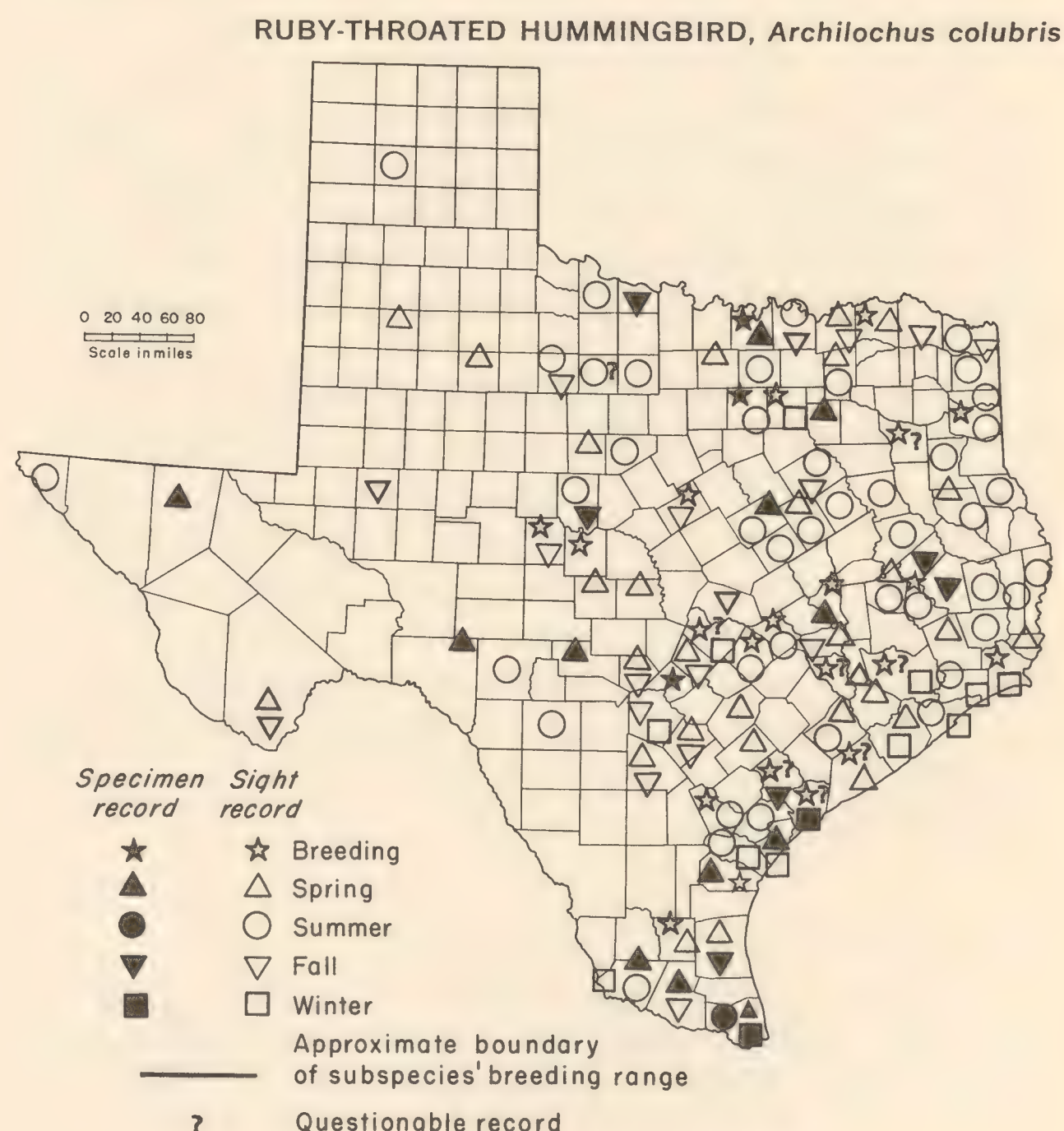
Male: metallic green above with tiny white spot back of eye; glowing orange-red (changing to gold or black) gorget; dull brownish white below with green-glossed gray sides; forked tail, essentially blackish. *Female*: similar above, but buffy white below (sometimes has obscure dusky speckles on throat) with brownish wash on sides; slightly notched tail (green centrally, mostly blackish laterally; no rufous) with white corners. Length, 3¾ in.; wingspan, 4¼; weight, .11 oz.

RANGE: C. Saskatchewan (rarely c. Alberta) to Nova Scotia, south through e. United States (west to e. Great Plains) to e. Texas, Gulf coast, and s. Florida. Winters

chiefly in Mexico (except n.w. part) and Central America; also s. Florida (a few); irregularly s. Texas (including upper coast) and Cuba.

TEXAS: (See map.) *Breeding*: Early Apr. to early Sept. (eggs, Apr. 14 to June 22; young being fed as late as Sept. 1) from near sea level to 2,300 ft. Fairly common to uncommon in much of eastern half south to Bastrop and upper coast; scarce west to 100th meridian and south to Comal Co. (formerly?) and central coast; rare in Falfurrias area, Brooks Co. (nested 1963, 1965, 1968, 1969). *Migration*: Mid- and late Mar. to mid-May; late July or early Aug. to late Oct. (extremes: Feb. 3, June 17; July 14, Nov. 27). Very common (usually along coast) to uncommon east of 100th meridian; scarce west to Amarillo, Lubbock, Midland, and Del Rio; rare in most of Trans-Pecos; casual in El Paso region. *Winter*: Dec. to late Feb. Scarce to rare along coast and in and near Rio Grande delta; casual on eastern edge of Edwards Plateau. One sighting from north central Texas: Dallas (Feb. 10, 1929, C. Kelley).

HAUNTS AND HABITS: The Ruby-throated is the only hummingbird which normally nests in the eastern United States. Formerly it bred generally over the eastern half of Texas, leaving the western half to the Black-chin. Although still widespread as a migrant in the state, during the twentieth century the Rubythroat has gradually become a less enthusiastic breeder than its western relative. The present species seeks open coniferous and mixed woodlands, meadows with scattered groves and flowering vegetation, and town yards that provide blossoming shrubs or feeders. Ornamental flowers much sought for their nectar include honeysuckle and lantana. In springtime in eastern Texas this hummingbird eagerly probes the tubular flowers of red gilia (*Ipomopsis rubra*) and blossoms of many other wild



flowers. In fall a major source of nectar, insects, and pollen is the brilliant scarlet flowers of large and small forms of Turk's cap (*Malvaviscus*). This May-to-October-blooming shrub is still in flower when masses of Rubythroats are migrating southward through Texas.

The Rubythroat's buzzing flight is swift and flashing; like other hummers, it maneuvers instantly in any direction. Sometimes it remains suspended in air, motionless except for vibrating wings; many movements appear to start with a thrust of its tail. Capable of long-sustained flights, some individuals cross the Gulf of Mexico, particularly in spring. In springtime nuptial flight, the male with puffed gorget flies slowly—for a hummer—back and forth in pendulum style; at this time the humming of his wings sounds louder than usual. During the performance the female is generally perched a few feet or yards away; mostly she seems to ignore the display.

Notes of the Ruby-throated Hummingbird include high-pitched squeaks, squeals, jabberings, and sharp *chip*'s, uttered separately or interspersed.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts metallic bronzy green; middle tail feathers same but rather more bluish; remainder of tail dark metallic purple or purplish bronzy black; wing-quills fuscous with metallic purplish sheen; wing-coverts bronzy green like back; very small postocular spot white; chin, cheeks, and ear-coverts dull black or fuscous black; throat metallic geranium red, changing to gold or green in some lights; jugulum dull brownish white or very pale buffy gray; middle of breast darker gray; middle of abdomen dull white; sides and flanks dull gray overlaid with metallic bronzy green; under tail-coverts pale brownish gray sometimes glossed with green and margined with dull white. Bill dull black; iris dark brown; legs and feet dark brown or dull black; claws black. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, sometimes very little different, but usually upper parts have slightly broader dull buff or light brown edgings; metallic green of lower surface is more obscured by dull light gray edgings of feathers. *Adult female, nuptial:* Acquired by wear from winter. Upper parts similar to male but rather duller on forehead; middle tail feathers like back, remainder of rectrices broader and less sharply pointed than in male, the three outermost metallic bronzy green on basal portion, brownish black for subterminal third, and broadly tipped with white; auricular region dull mouse gray; lower surface brownish white or dull buffy white, sides washed with pale buffy brown; tufts on flanks white. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but upper surface with slightly broader edgings of buffy brown. *Male, first nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adult male, but jugulum and posterior lower surface more buffy (less grayish); sides and flanks less extensively and less solidly metallic green. *Male, first winter:* Acquired by partial postjuvinal molt. Similar to first nuptial male, but upper surface slightly duller; throat without metallic gorget, instead like remainder of lower parts, but with conspicuous streaks or spots of olive brown to fuscous and a few scattered red metallic feathers; also with less metallic green on sides and flanks, thus general appearance paler, particularly middle portion. *Female, first nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adult female, but lower parts more buffy; sides and flanks with less metallic green. *Female, first winter:* Acquired by partial postjuvinal molt. Similar to adult female in winter; like it, without distinct streaks of olive brown on throat; however, upper surface, particularly

forehead, more conspicuously edged with dull buff or pale dull gray—avellaneous to tulleul buff; sides and flanks more buffy. Similar to first winter male but larger; feathers of upper surface more light-tipped; lower parts more buffy and paler, more whitish; throat without conspicuous brown streaks and with only slightly buffy markings. *Male, juvenal:* Acquired by postnatal growth. Similar to nuptial adult female, but feathers of upper parts very narrowly and very obscurely margined with pale gray, light brown, or pale buff; feathers of throat having small shaft streaks of hair brown or fuscous; lower surface usually more strongly tinged with buff, particularly on sides and flanks. Similar to first winter male, but bill at first decidedly shorter; feathers of upper parts more conspicuously tipped with buffy brown or wood brown; no metallic red feathers on throat. This plumage is assumed by the thirteenth day after hatching, though rectrices at that time are not full grown. *Female, juvenal:* Acquired by postnatal growth. Similar to first winter female, but at first bill decidedly shorter, and usually, particularly in early stages after hatching, feathers of upper surface more broadly light-tipped. Similar to juvenal male, but throat without dark brown streaks or spots; lower parts less deeply buffy. *Natal:* None. Bird hatched unfeathered, but after five days a few drab juvenal down feathers appear.

MEASUREMENTS: *Adult male:* Wing, 37.1–39.9 (average, 38.6) mm.; tail, 25.4–28.4 (26.9); bill (exposed culmen), 15.0–17.3 (16.0). *Adult female:* Wing, 43.4–45.5 (44.4); tail, 24.9–27.4 (25.9); bill, 17.0–19.6 (18.3).

TEXAS: *Breeding:* Collected in Cooke (eggs), Tarrant (eggs), and Comal (eggs, 19th century) cos. *Migration:* Collected north to Cooke, east to Polk, south to Cameron, west to Val Verde and Culberson cos. *Winter:* Taken northeast to Calhoun, southwest to Cameron cos.

NESTING: *Nest:* In scattered or open woodlands, dense forests, margins of woodlands, orchards, and other cultivated lands; in tree or bush, usually not at great height; soft, beautifully made cup, saddled usually on small limb; made of various plant fibers and vegetable down, occasionally bits of bark, covered on outside with lichens, and lined with plant down. *Eggs:* 2, usually elliptical oval; white, unmarked; average size, 13.0 × 8.4 mm.

BLACK-CHINNED HUMMINGBIRD, *Archilochus alexandri* (Bourcier and Mulsant)

SPECIES ACCOUNT

Male: metallic bronzy green above with white spot behind eye; black chin, upper throat; metallic violet (often appears black) lower throat-band; whitish below with white chest-collar and crissum and green-glossed sides; has straight black bill and slightly forked tail (green centrally, blackish laterally). *Female:* very plain; closely resembles female Rubythroat (not safely separated in field), but grayish (not buffy) white below, often without discernible wash on sides; has white crissum. Length, 3¾ in.; wingspan, 4½; weight, .12 oz.

RANGE: S. British Columbia and w. Montana, south through w. United States to n. Baja California; Sonora, c. Nuevo León, Tamaulipas, and c. Texas. Winters mainly in Mexico, south to Guerrero, c. highlands, and c. Veracruz.

TEXAS: (See map.) *Breeding:* Late Mar. to mid-Aug. (eggs, Apr. 4 to July 21; young in nest, Apr. 18 to Aug. 12) from 400—rarely 50—to 8,750 ft. Common to fairly common from Trans-Pecos east across southern Panhandle and Edwards Plateau to Waco, Austin, and San Antonio vicinities; uncommon to scarce in remainder of

Panhandle (local nesting suspected) and Dallas-Fort Worth area; rare and highly irregular on central coast (nested, Welder Wildlife Refuge, 1964, 1970), in Rio Grande delta (2 or 3 pairs present at Anzalduas, Feb.-Aug., 1966, J. C. Arvin), and slightly upriver from the delta (nested at Roma, west of Rio Grande City, 1964, fide Pauline James). *Migration*: Mid- and late Mar. to early May; mid-July to mid-Oct.—a few into Dec. (extremes: Mar. 11, May 12; July 8, Jan. 6). Common to fairly common through regular breeding range, south to Laredo and central coast; scarce to rare through Rio Grande delta; largely absent from eastern third, but casual at and near Tyler and Houston. *Winter*: Casual on central and lower coasts, and in Rio Grande delta.

HAUNTS AND HABITS: In contrast to the strictly arid-land Lucifer and the moist-woodland Rubythroat, the Black-chinned Hummingbird is adapted to both agave-cactus desert and subhumid juniper-oak woods. Since well over half the 254 Texas counties receive between ten and thirty-three inches of rain per year, it is not surprising that the most numerous Texas-nesting hummer is the Blackchin. In fact it could be said that any hummingbird nest found in the western two-thirds of the state was built by a female Blackchin unless there is very strong proof to the contrary. From California to west Texas, *Archilochus alexandri* constructs nests without benefit of lichen decoration. Many individuals in central Texas, however, do use lichens, thus confounding bird books and rendering this species' architecture indistinguishable from that of the Rubythroat.

In the Trans-Pecos, Blackchins extract nectar from and catch tiny insects near agaves, tree tobacco, and various other desert flowers. On hills and in canyons

of the Edwards Plateau these birds probe Texas redbud (*Cercis canadensis texensis*), white buckeye (*Aesculus glabra arguta*), red buckeye (*A. pavia*), red gilia (*Ipomopsis rubra*), and many other flowering plants.

Beginning in the 1940's, residents of Kerrville on the mid-Edwards Plateau have maintained a remarkably high density of red sugar water hummingbird feeders. Apparently practically every home in this large town exhibits at least one dispenser of syrup. From late March to mid-August, six or more hummers buzz, bicker, and squeak around almost every sweet bottle. The Blackchin force is overwhelming: Only during big migrations does an occasional Rubythroat or Rufous join the hordes of *A. alexandri*.

Movements of the Blackchin, like its relatives, are amazingly swift and well controlled. A standard nuptial flight of the male involves pendulumlike sweeps on whirring wings. In another display he executes several gigantic elongated figure eights, the long axes of which are horizontal instead of vertical. In both displays the bird often utters at the lowest point of the flights either a variety of squeaks or plaintive pulsating liquid notes.

Blackchin vocalizations are thin, agitated chipperings. The springtime song of the male, often delivered from a regular perch, has been described by G. F. Simmons as a high-pitched warble somewhat like the sound made by whistling through the teeth. These warblings are so extremely high, however, that very few people can hear them; thus, the statement has arisen that the Anna's is the only U.S. hummingbird with a definite song.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts rather dull metallic bronzy or dark green, duller and more brownish or blackish on pileum; middle tail feathers like back, pointed feathers of remainder of tail bronzy purplish black; wing-quills fuscous with metallic purplish sheen; upper wing-coverts like back; lores, cheeks, chin, upper throat, and ear-coverts black; postocular spot white; lower throat metallic violet or violet purple, changing to black; jugulum grayish white, pale dull buffy white, or gray; middle of breast, abdomen, and lower tail-coverts similar, latter with darker shaft streaks; sides and flanks washed or mixed with metallic green like upper surface; tufts on flanks and on each side of rump white. Bill black; iris deep sepia; legs and feet black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but feathers of upper surface slightly edged with buffy brown; metallic green of sides and flanks more or less obscured by gray feather tips. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but tail feathers much less sharply pointed, more rounded at tips; three outer rectrices broadly tipped with white, middle pair, and pair next to middle with bases metallic green, middle pair having little or no bluish sheen; entire lower parts dull white, grayish white, or brownish white; throat sometimes slightly streaked or spotted with hair brown or fuscous. Bill black; iris very dark brown; legs and feet purplish black. Differs from adult female of Ruby-throated Hummingbird, *Archilochus colubris*, in longer bill and wing; more grayish or bluish green (less yellowish or golden) upper surface; more pointed (less rounded) outer tail feathers; and somewhat paler (less buffy) lower surface. *Adult female, winter*: Acquired by complete postnuptial molt. Differs from nuptial adult female as does adult male in winter from nuptial adult

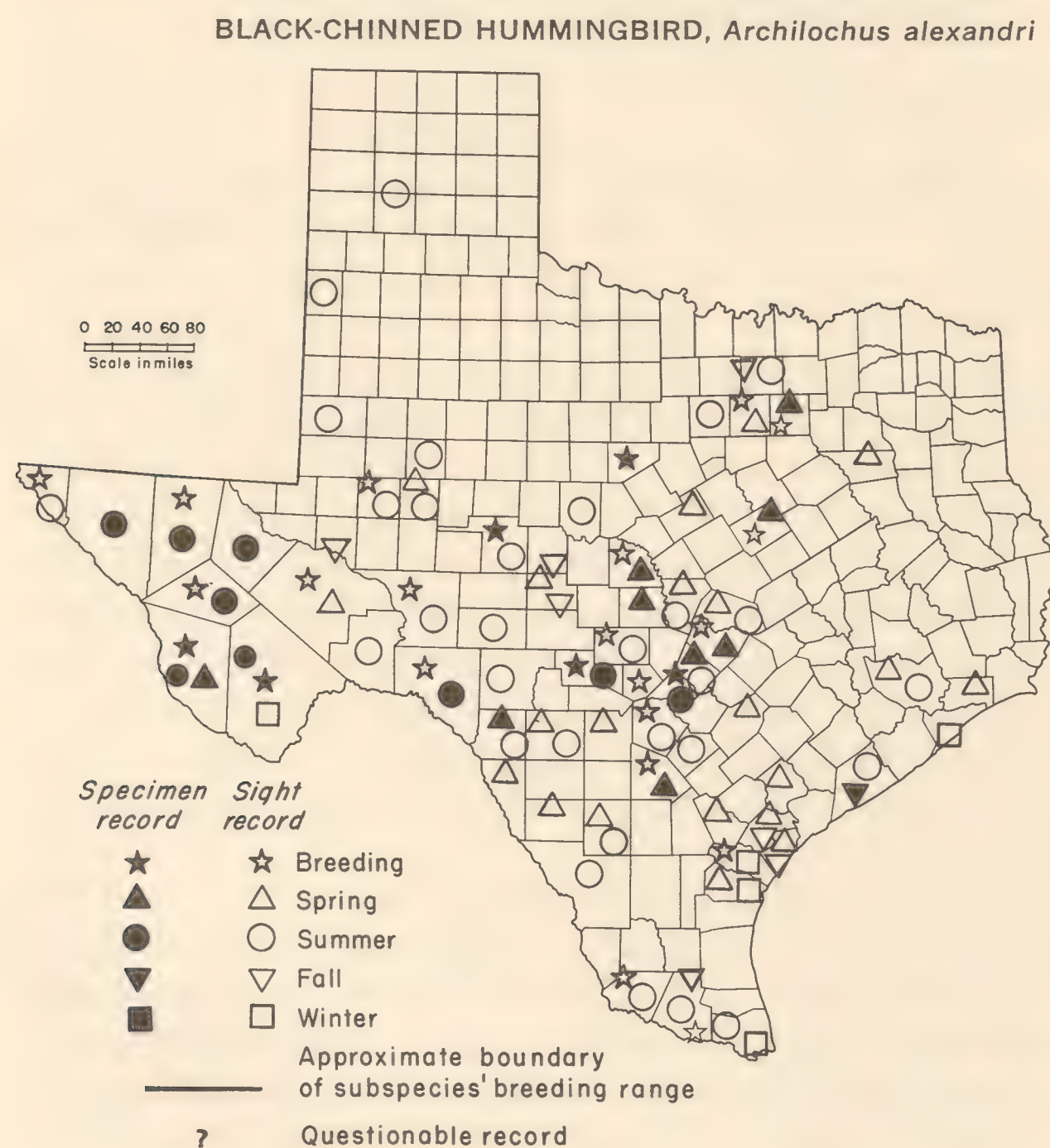




PLATE 16: Lewis' Woodpecker, *Asyndesmus lewis*

male. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult male, but lower surface somewhat more buffy, less clearly white or gray, and green on sides of body less extensive, less uniform, and more brownish. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial male, but tail shorter, rectrices broader, as in adult female; feathers of upper parts with conspicuous buffy brown to dull pale buff tips; no metallic gorget, but throat like lower parts, conspicuously streaked or spotted with olive brown, and with a few purple metallic feathers; remainder of lower surface duller, somewhat more buffy; sides and flanks less extensively metallic green, more mixed with dull buff or brown. *Female, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult female, but lower parts, including throat, sides, and flanks, more buffy (less clearly gray or grayish white). *Female, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial female, but upper surface more broadly tipped with dull pale buff, dull light brown, or buffy brown; also averaging somewhat more buffy below. Similar to first winter male, but above somewhat more rufescent (less grayish); below rather more buffy, throat with no metallic purple feathers and no dark brown streaks, though sometimes with pale brown streaks; flanks more rufescent or buffy. *Male, juvenal*: Acquired by postnatal growth. Pileum rather dull pinkish cinnamon, spotted or barred with rather dark citrine drab; back and rump dark greenish olive, spotted or barred with dull pinkish cinnamon; wings fuscous, wing-coverts tipped with pinkish cinnamon or pale pinkish cinnamon; sides of head dull pale buff; lower parts buffy white, but sides dull light vinaceous cinnamon, similar to first winter male, but bill at first much shorter; upper surface more broadly tipped with brown or buff, and no metallic purple feathers on throat. Similar to adult female in winter, but feathers of upper parts tipped with light dull buff; lower parts more or less tinged with buff, throat minutely streaked or spotted hair brown or fuscous. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but usually more buffy below, the dark brown streaks or spots on throat absent or smaller and more obscure. Similar to first winter male, but bill decidedly shorter; upper parts more broadly edged with buff and brown; lower surface usually more deeply buff. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 41.4–43.9 (average, 42.7) mm.; tail, 23.6–27.9 (25.7); bill (exposed culmen), 18.0–20.6 (19.3). *Adult female*: Wing, 46.0–48.5 (47.0); tail, 25.9–27.4 (26.7); bill, 19.6–22.1 (20.9).

TEXAS: *Breeding*: Collected north to Eastland (eggs) and Dallas, south to McLennan, Travis, and Atascosa (eggs), west to Val Verde, Presidio, and Hudspeth cos. Albino adult female collected: Kerr Co., Lacey Ranch (June 20, 1913, Shirley Coppock). *Migration*: One specimen outside breeding range: Matagorda Co., Matagorda (Nov. 28, 1936, H. H. Kimball).

NESTING: *Nest*: In canyons, mountains, and on mesas, often stream valleys; in trees or bushes, on forks or main stems near ends of small branches, frequently those hanging over water; one record of nest placed in an old nest of a House Finch; small cup of plant fibers fastened together with insect webs, often covered on outside with lichens in central Texas, but ordinarily not thus decorated elsewhere; lined with plant down. *Eggs*: 2–3, usually 2; elliptical oval; white, unmarked; average size, 12.7 × 8.4 mm.

CHISOS HUMMINGBIRD, *Phasmornis mystica* Oberholser, new genus and species

GENERIC ACCOUNT

Phasmornis derived from *Φάσμα*, phasma, ghost; and *ὄρνις*, ornis, bird.

DIAGNOSIS: Similar to genus *Archilochus* Reichenbach, but tail double-rounded, instead of forked or

emarginate; all rectrices sharply pointed instead of moderately rounded; fifth, sixth, seventh, and eighth primaries, counting from outermost, not abruptly narrowed, but emarginate and diagonally pointed on inner webs; bill more slender; no gorget of metallic feathers.

DESCRIPTION: Bill slender, terete, practically straight, narrow at base and sharply pointed; nasal grooves reaching forward for more than half length of bill; tail about three-fifths length of wing; bill about four-fifths length of tail; tail with middle pair of feathers broader than remainder and abruptly pointed, others abruptly pointed and succeeding narrower than middle pair, outermost pair being narrowest and most sharply pointed; middle pair somewhat shorter than next pair, and outermost pair shorter than next inner pair; upper tail-coverts reaching to within 8 mm. of end of tail; lower tail-coverts reaching to within 5 mm. of end of tail; tarsi feathered only for a short distance at upper end.

TYPE: *Phasmornis mystica* Oberholser, new species.

SPECIES ACCOUNT

Male (probably): a small hummer with a straight, somewhat short, slender black bill; somewhat rounded tail. Dull metallic green above; mostly light gray below without any metallic feathers on throat and with pointed tail feathers that have no light tips. Length, 3½ in. (.92 mm.); wingspan, 4 (100).

RANGE: Known only from type locality in Chisos Mts., s. Trans-Pecos Texas.

TEXAS: The only record is a specimen, apparently an adult male, collected at Boot Spring in Chisos Mts. (July 4, 1932, C. H. Mueller).

EDITOR'S REMARKS: As of 1972, *Phasmornis mystica* is still based on the unique specimen, which perhaps represents a mutation or hybrid.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: Similar to adult female Black-chinned Hummingbird, *Archilochus alexandri*, but decidedly smaller throughout; pileum darker and more metallic greenish (less brownish); remainder of upper surface darker, duller, less yellowish green; tail darker, duller, and more bluish, particularly on terminal portion; rectrices with no light tips, but uniformly colored on their lower surface; lower parts darker and mostly duller, but sides and flanks with considerable metallic citrine. *Adult male, nuptial plumage* (probably): Pileum metallic forest green, mixed with metallic hellebore green; back and remaining upper parts mixed metallic yellowish oil green, citrine, spinach green, and cerro green, dulled by drab edgings of feathers; middle pair of tail feathers metallic cerro green, terminally metallic indigo green, next pair purplish black at base, margined broadly with metallic green of middle pair, but duller, third pair from middle purplish black at base, terminally dull metallic anthracene purple, tipped with dull metallic green like preceding pair; outer two pairs of rectrices similar, but duller, and none of rectrices with light tips; quills dark dull vinaceous drab with metallic sheen; wing-coverts dull metallic green similar to that of upper parts, but still duller; lower surface dull grayish white, washed with light drab, middle portion of feathers on lower tail-coverts light drab; tuft of pure white feathers on each side of abdomen; sides and flanks drab, spotted with metallic buffy citrine and

metallic dull citrine; no metallic gorget; lining of wing like upper wing-coverts. Bill and feet dull black.

MEASUREMENTS: *Adult male* (probably): Wing, 42 mm.; tail, 23.5; bill (exposed culmen), 18.5; tarsus, 5; middle toe without claw, 3.5.

TYPE: *Adult male* (probably); Boot Spring, Chisos Mts., Texas; July 4, 1932; C. H. Mueller.

TEXAS: See species account.

[**COSTA'S HUMMINGBIRD**, *Calypte costae*
(Bourcier)]

Glides more than other desert hummingbirds. *Male*: metallic purple cap and extensive gorget (lateral feathers highly elongated); metallic green above with white postocular spot; white sides of neck, prominent when not hidden by fully extended gorget; white breast; brownish green posterior under parts; has straight black bill and slightly forked tail. *Female*: indistinguishable in the field from female Blackchin. Length, 3½ in.; wingspan, 4½.

RANGE: C. and s. California (including Channel Islands) to s.w. Utah, south through arid regions to s. Baja California (and all near-shore islands), Sonora (including Tiburón and San Esteban islands), s. Arizona, and s.w. New Mexico. Largely migratory in United States, wintering mainly from s.e. California and s.w. Arizona to s. Baja California and Sinaloa.

TEXAS: *Hypothetical*: Sightings from Aug. 7 to Sept. 29. Very rare visitor to El Paso and Big Bend Nat. Park; casual at Rockport (4 adult males, Sept. 12-14, 29, 1956, Connie Hagar, P. R. Lenna, and Mrs. T. J. Richmond; Sept. 16-20, 26, 1957, Hagar, Lenna, B. L. Monroe, Jr., et al.). One winter sighting: Big Bend Park, Rio Grande Village (1 male, Dec. 17, 1966, Dick Russell, R. H. Wauer).]

ANNA'S HUMMINGBIRD, *Calypte anna* (Lesson)

SPECIES ACCOUNT

A rather large, stout hummer. *Male*: cap and extensive gorget metallic rose red; metallic green above with white postocular spot; whitish collar separates gorget from mostly grayish posterior under parts and green sides; has slightly forked tail. *Female*: resembles smaller female Rubythroat, but darker below (grayer with greenish sides) with a few red central throat-spots; has brown wash on pileum and dull white postocular streak. (Young male Rubythroat may also have red throat-spots, but his tail is forked, rather than nearly square tipped as is that of female Anna's.) Length, 4 in.; wingspan, 5; weight (male), .17 oz.

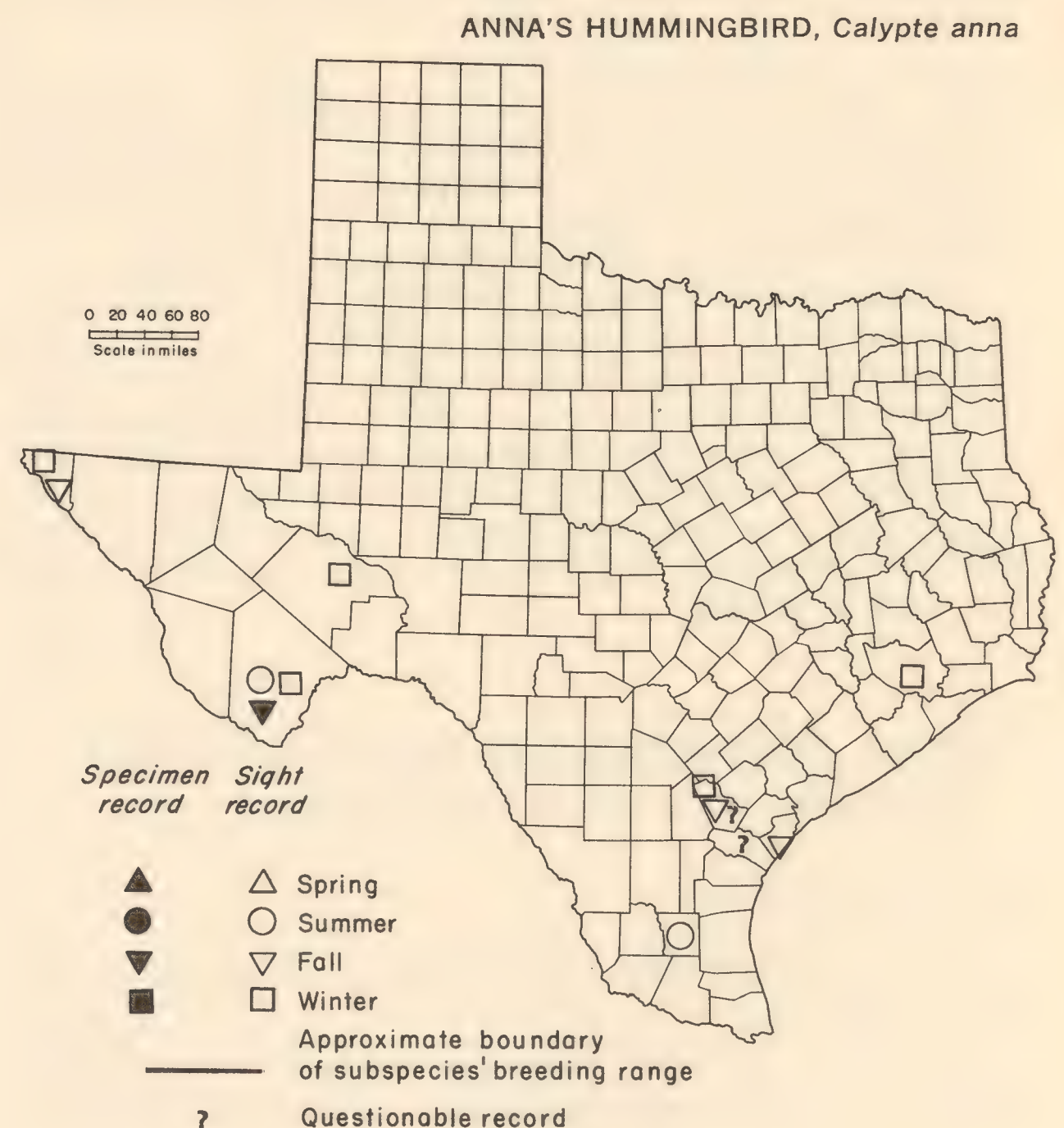
RANGE: California west of Sierra Nevadas (from San Francisco and head of Sacramento Valley south, including Santa Cruz Island) to n.w. Baja California (including Guadalupe, Cedros, and Los Coronados islands). Winters in and near breeding range and east to s. Arizona, n. Sonora, and s. Texas (irregularly).

TEXAS: (See map.) *Migration*: Early Sept. to late Oct.

(extremes: July 24, Nov. 19). Rare and erratic in fall at El Paso and Big Bend Nat. Park; erratic at Rockport, though occasionally in sizable numbers (e.g., 300-plus birds observed, Sept. 11-29, 1956, Connie Hagar, et al.); also reported from Beeville (Oct. 25, 1957, Velma Geiselbrecht), Falfurrias (Aug. 26, 1968, A. W. O'Neil), and Laguna Vista on s. Padre Island (female, Oct. 30-31, 1971, J. C. Arvin). *Winter*: Early Nov. to late Dec. —occasionally to mid-Feb. Rare and irregular in Trans-Pecos (chiefly along Rio Grande); casual at Beeville (Jan. 3 to Feb. 15, 1967, Mrs. Teal Adkins, V. Geiselbrecht, Mrs. J. J. Jordan) and Houston (1 male present and photographed, Jan. 12-29, 1966, Margaret Anderson, T. B. Feltner, Charlotte Johnson, Nancy M. Strickling, Norma C. Oates, John Tveten, et al.; Dec. 10, 24, 1966, Mr. and Mrs. R. B. Moore). See detailed account for specimen evidence.

HAUNTS AND HABITS: The hardy Anna's Hummingbird is unique among U.S. Trochilidae in three respects: It is the only hummer which seems to thrive in large numbers in smog-palled coastal California, it is the sole member of its family to winter chiefly in the United States, and it is the only hummingbird in this country which has what is widely considered a definite song. The bird is a familiar sight about blossoming shrubs and feeders in gardens and parks. In less populated areas it seeks alder, live oak, sycamore, sumac, maple, and other trees and bushes on mountains and foothills; here, typically in a dense grove in a narrow canyon, the female saddles a substantial nest of plant fiber, mosses, cobwebs, and lichens on a tree limb.

The Anna's feeds on nectar, but apparently is more insectivorous than most other western hummingbirds; this is possibly why it winters successfully in California when flowering plants are less numerous. Additional



foods in good supply in the mild Pacific climate of California are spiders, sugar water in feeder bottles, and sap exuding from injured or sapsucker-punctured trees.

A heavy *chick* note, uttered usually while *Calypte anna* feeds, speeds up considerably when the bird is alarmed. An excited rattling *ztikl-ztikl-ztikl*, etc., is generally given when birds are in chase. The male's song is a confusion of high-pitched squeaks, gurgles, and hisses.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead and crown brilliant metallic rather purplish tyrian rose to rhodamine purple; remainder of upper surface metallic parrot green to grass green or metallic warbler green to orange citrine, often a mixture of two or three of these colors; tail forked, outer feathers much narrower than middle pair, middle rectrices metallic warbler green, changing terminally to metallic parrot green or even bluish green; remainder of tail chaetura drab to chaetura black, inner edges of feathers hair brown, these outer feathers having slight metallic luster; wings fuscous with bluish or violet gloss, lesser wing-coverts metallic green like back, shorter upper primary coverts similar but duller; sides of head and of neck, chin, and throat metallic tyrian rose to rose red; postocular spot white; lower surface between light grayish olive and light drab, a narrow collar at posterior edge of rose gorget lighter, duller, and somewhat more buffy; sides and flanks, and to a less degree remainder of lower surface, more or less spotted or overlaid with metallic green like upper surface; lining of wing fuscous, more or less overlaid with dull metallic green. Bill dull black; iris dark brown; feet dull dark brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but gray edges on green feathers of upper surface broader; also gray edges of green feathers on lower surface, including lower tail-coverts, much broader and more or less concealing metallic green on sides and flanks. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male but smaller; tail double-rounded instead of forked; metallic green of upper surface somewhat more yellowish; pileum metallic antique brown or light amber brown, more or less mixed with dull metallic green of remainder of upper surface; forehead duller where feathers are edged narrowly with buffy brown; postocular streak, instead of spot, dull white; middle rectrices like those of male; remaining rectrices with broad subterminal band of brownish black with slight green gloss and broadly tipped with dull light drab gray or dull white, basal portion of these feathers metallic green similar to middle pair though somewhat less bluish; below much paler than male, chin and throat tiller buff with some feathers of central portion spotted with fuscous and metallic spinel red or metallic jasper red; remainder of lower surface between drab gray and smoke gray; sides and flanks more or less metallic green like upper surface. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but upper surface somewhat obscured by broader buff edgings of feathers; metallic green feathers of sides and flanks veiled by grayish edgings. *Male, first nuptial:* Acquired by complete prenuptial molt. Like nuptial adult male. *Male, first winter:* Acquired by partial postjuvenile molt. Similar to adult male in winter, but tail not deeply emarginate, instead slightly double-rounded, feathers broader and rounded at tips; feathers of upper surface somewhat more broadly tipped with brown and dull buff; relatively few metallic rose feathers on throat and sides of head, sometimes none on sides of head, and lateral feathers of gorget usually not lengthened; metallic green of lower surface duller and less extensive. Similar to adult female in winter, but tail feathers narrower and black subterminal band narrower; pileum sometimes with metallic rose feathers; throat with large number of same; lower surface darker and duller. *Female, first*

nuptial: Acquired by complete prenuptial molt. Like nuptial adult female. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to adult female in winter but rather duller, more brownish, the brown or dull buffy edgings of upper surface broader, particularly on pileum; lower surface less metallic green; throat with fewer and smaller metallic rose-colored feathers. *Male, juvenal:* Acquired by postnatal growth. Similar to first winter male, but bill at first shorter; feathers of upper surface more conspicuously tipped with dull light brown and dull buff; lower surface duller with less metallic green and with no metallic rose feathers on throat. *Female, juvenal:* Acquired by postnatal growth. Similar to first winter female, but bill at first shorter; upper surface more broadly edged with dull light brown or dull buff; throat spotted hair brown to drab or grayish olive, sometimes with a little metallic light orange citrine; lower surface averaging duller with less metallic green and no metallic rose feathers on throat; older bird loses some of brown edgings on upper surface, then appearing more like first winter female, but still lacks metallic rose feathers on throat. Similar to juvenal male, but lower surface darker and throat less densely spotted.

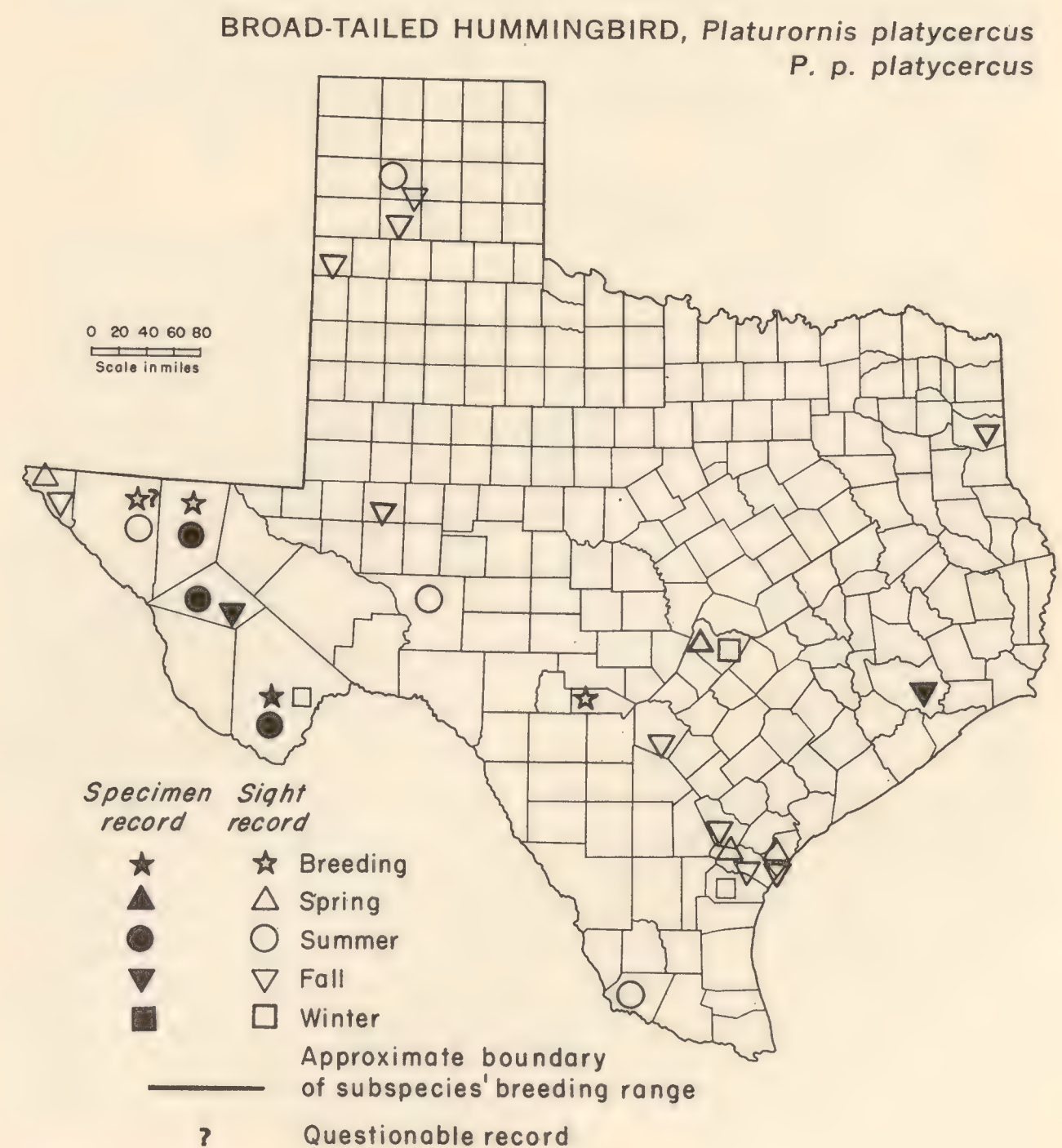
MEASUREMENTS: *Adult male:* Wing, 48.5–51.1 (average, 49.8) mm.; tail, 30.5–32.5 (31.2); bill (exposed culmen), 17.5–20.1 (18.3). *Adult female:* Wing, 48.0–51.1 (49.5); tail, 24.9–28.9 (27.2); bill, 17.0–22.1 (18.8).

TEXAS: *Migration:* Two specimens, both from Brewster Co.: Chisos Mts., Oak Creek, Basin, 5,400 ft. (Oct. 23, 1936, A. E. Borell); near Santa Elena Canyon (Nov. 5, 1967, M. K. Rylander, R. H. Wauer).

BROAD-TAILED HUMMINGBIRD, *Platurornis platycercus* (Swainson)

SPECIES ACCOUNT

Selasphorus platycercus of A.O.U. check-list, 1957 (see Appendix A). Both sexes have a wide, rounded tail. *Male:* metallic dark green above with white postocular spot; has rose red or purplish (not orange-red)



gorget; whitish below with grayish green sides; tail green centrally with blackish outer feathers. In flight, slots formed by tapering of two outer primaries produce (except when molted) a loud, diagnostic trill. *Female*: closely resembles smaller female Rufous, but metallic rose red throat-spots (orange-red in Rufous) rarely present; crissum normally paler. Length, 4 in.; wingspan, 5; weight (male), .11 oz.

RANGE: E. California to n. Wyoming, south, chiefly in highlands, through w. United States and mainland Mexico to mountains of Guatemala. North American race migratory in United States, wintering mainly in highland Mexico.

TEXAS: (See map.) *Breeding*: Late Mar. or early Apr. to mid-June (nest located, McKittrick Canyon, Guadalupe Mts., May 3, 1939, T. D. Burleigh; nest building, Laguna Meadow in Chisos Mts., May 3, 1935, G. M. Sutton; female feeding 2 fledged young, Laguna Meadow, May 17, 1969, Julie Hotchkiss, Becky and Sharon Wauer; young in nest observed and photographed, Sabinal Canyon in Bandera Co., May 15, 1960, C. R. Bender, et al.) from about 1,500 to 8,500 ft. Common to fairly common in mountains of Trans-Pecos; 1 nesting reported along Rio Grande in Brewster Co.; casual on southern Edwards Plateau. *Migration*: Late Mar. to late Apr.; early Aug. to mid- or late Oct. (extremes: Mar. 23, May 31; July 21, Nov. 24). Common (chiefly in mts.) to fairly common in fall through Trans-Pecos; uncommon, though occasionally reported in impressive numbers, on central coast; scarce in northern Panhandle; rare at San Antonio and Falcon Reservoir in Starr Co.; casual at Marshall and Houston. Fairly common in spring through Trans-Pecos; scarce on central coast. *Winter*: Late Sept. to mid- or late Mar. Scarce to rare in Big Bend Nat. Park (chiefly on floodplain). Sightings of individual birds: Travis Co., Austin (Sept. 5, 1970–Mar. 19, 1971, J. W. White, et al.); Nueces Co., Corpus Christi (Dec. 31, 1972, David Simon, Rose Ann Rowlett, et al.). See detailed account for specimen evidence.

HAUNTS AND HABITS: Characteristic hummingbird of the Rocky Mountains is the Broad-tailed. As a breeder in Texas, it is normally restricted to Trans-Pecos mountains where it inhabits pine-oak woodlands and juniper scrub on slopes and in canyons and gulches; sometimes, especially during migration, it ranges out to broad valleys, foothills, and more open country.

In flight this hummingbird is exceedingly swift and moves quickly and easily in any direction. Often in early morning, Broadtails swarm to bathe in a mountain stream or to feed on nectar of blooming agaves, yuccas, *Salvia*, *Robinia*, *Penstemon*, *Lupinus*, and many other flowering plants, and the insects attracted to these blossoms. This hummer spends much time gleaning insects from pine and pinyon foliage; it sometimes catches flies and gnats in the air. The zealous male protects his territory from hawks, kingbirds, and other large or small birds. Nuptial flight, sometimes both male and female participating, is a swift, almost perpendicular ascent of one hundred feet or more, fol-

lowed by a vertical dive, and another ascent for a repeat performance. This display starts in spring and sometimes lasts into August.

A thin, tinny *chip* is the common vocalization. In flight the male's wings produce a loud, decidedly metallic buzz or rattling trill which is recognizable from that of other species by its clear, almost musical quality.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BROAD-TAILED HUMMINGBIRD, *Platuerornis platycercus platycercus* (Swainson)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts metallic dark green with more or less bronzy sheen or mixture; middle pair of tail feathers metallic green, somewhat more bluish; remainder of tail purplish black, next to middle pair usually with more or less metallic greenish sheen, outer web margined, except terminally, with cinnamon rufous; wing-quills fuscous with metallic purplish gloss; wing-coverts metallic green like back; postocular spot white; chin and throat metallic reddish purple; jugulum grayish white, becoming duller (more grayish) on middle of breast and abdomen; sides and flanks darker, somewhat washed with pale cinnamon and glossed with metallic green like back; lower tail-coverts white with shaft streaks of light dull brown or light bronzy green; tufts on each side of thighs and on flanks pure white. Bill dull black; iris dark sepia; legs and feet dull brown or dull black, soles of toes lighter. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Upper surface, including middle tail feathers, like adult male; has white postocular streak, instead of spot; tail feathers broader than those of male, three outer feathers broadly tipped with white and cinnamon rufous at base, with intermediate area purplish black; chin and throat dull buff or grayish white having small streaks or spots of dull bronzy or dull brown; throat rarely with a few metallic reddish purple feathers; jugulum similar but unspotted; breast and abdomen dull pale buff; sides, flanks, and crissum light cinnamon or cinnamon buff, lower tail-coverts sometimes partly grayish medially and sometimes margined with white; tufts on flanks white as in male. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial*: Acquired by complete prenuptial molt. Very similar to nuptial adult male. *Male, first winter*: Acquired by partial postjuvenile molt. Like adult female in winter, but bill rather smaller; feathers of upper parts, particularly those of pileum, rump, and upper tail-coverts, obscurely tipped with light brownish buff or cinnamon; lateral tail feathers much less cinnamon on basal portion; dull brown spots on chin and throat more numerous and larger. *Female, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to first winter male, but tail like that of adult female in winter, throat with fewer or smaller dull brown spots. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but bill much shorter, green of upper parts much duller, buffy edgings broader; dark spots on throat smaller, cinnamon of sides and flanks more pinkish. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but less rufous or cinnamon on basal part of outer tail feathers. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 46.5–50.5 (average, 48.3) mm.; tail, 29.9–35.1 (31.8); bill (exposed culmen), 16.0–19.0 (17.8). *Adult female*: Wing, 48.5–52.1 (50.5); tail, 27.9–32.5 (30.7); bill, 18.0–20.1 (18.8).

RANGE: N.e. Oregon (rarely) to s.e. Wyoming, south through U.S. Rockies and Mexican sierras to Oaxaca. Winters from Jalisco and State of México to Oaxaca.

TEXAS: *Breeding*: Collected in Culberson, Jeff Davis, and

Brewster cos. *Migration*: Dead bird (specimen?) found outside breeding range: Harris Co., Houston (Oct. 4, 1956, R. L. Fowler, J. P. O'Neill, H. S. Hoffman).

NESTING: Nest: In wooded mountains or other timbered areas, often along streams, in thickets, or woodlands; saddled on large or small twig of bush or tree; beautiful small cup made of willow, cottonwood, or other vegetable down, shreds of bark, bits of leaves and other plant fibers, covered on outside with lichens, bound together with spider and insect webs; lined with vegetable down. *Eggs*: 2; elliptical oval; not glossy; white, unmarked; average size, 12.7×8.4 mm.

RUFIOUS HUMMINGBIRD, *Selasphorus rufus* (Gmelin)

SPECIES ACCOUNT

Male: bronzy green forehead, crown, wing-coverts; bright rufous on back, rump, rounded tail (darker at tip), and lower breast; small white postocular spot; brilliant metallic orange-red (changing to gold) gorget; white upper breast, flank-tufts; whitish to cinnamon under tail-coverts. Nuptial flight (unlikely in Texas) is a closed ellipse (see Allen's). *Young male*: has more or less extensively green back. *Female*: bronzy green above; short white postocular streak; whitish below with dusky (and a few metallic orange-red) throat-spots; tawny sides; rufous crissum; considerable rufous at base of white-cornered tail. Length, $3\frac{3}{4}$ in.; wingspan, $4\frac{1}{4}$; weight, .11 oz.

RANGE: S. Alaska and s. Yukon, south to n.w. California (Trinity Mt. area), Oregon, Idaho, and w. Montana. Migrates chiefly through Pacific lowlands in spring, largely through mountains of w. North America (a few to w. edge of Great Plains, Texas coast) in late

summer and early fall. Winters mainly in Mexico south to Isthmus of Tehuantepec.

TEXAS: (See map.) *Migration*: Late July to late Sept.—a few to mid-Oct. (extremes: July 12, Nov. 30). Very common to fairly common in fall through Trans-Pecos; occasionally common on central coast to uncommon on upper and lower coasts; uncommon to scarce in northern Panhandle and central portions; rare at Midland, Fort Worth, Dallas. *Winter*: Early Nov. to mid-Mar. (extremes: Oct. 22, May 2). Uncommon (some years) to scarce along coast; scarce to rare in Big Bend (along Rio Grande), at San Angelo, on the southeastern edge of the Edwards Plateau, and in the Rio Grande delta. See detailed account for specimen evidence.

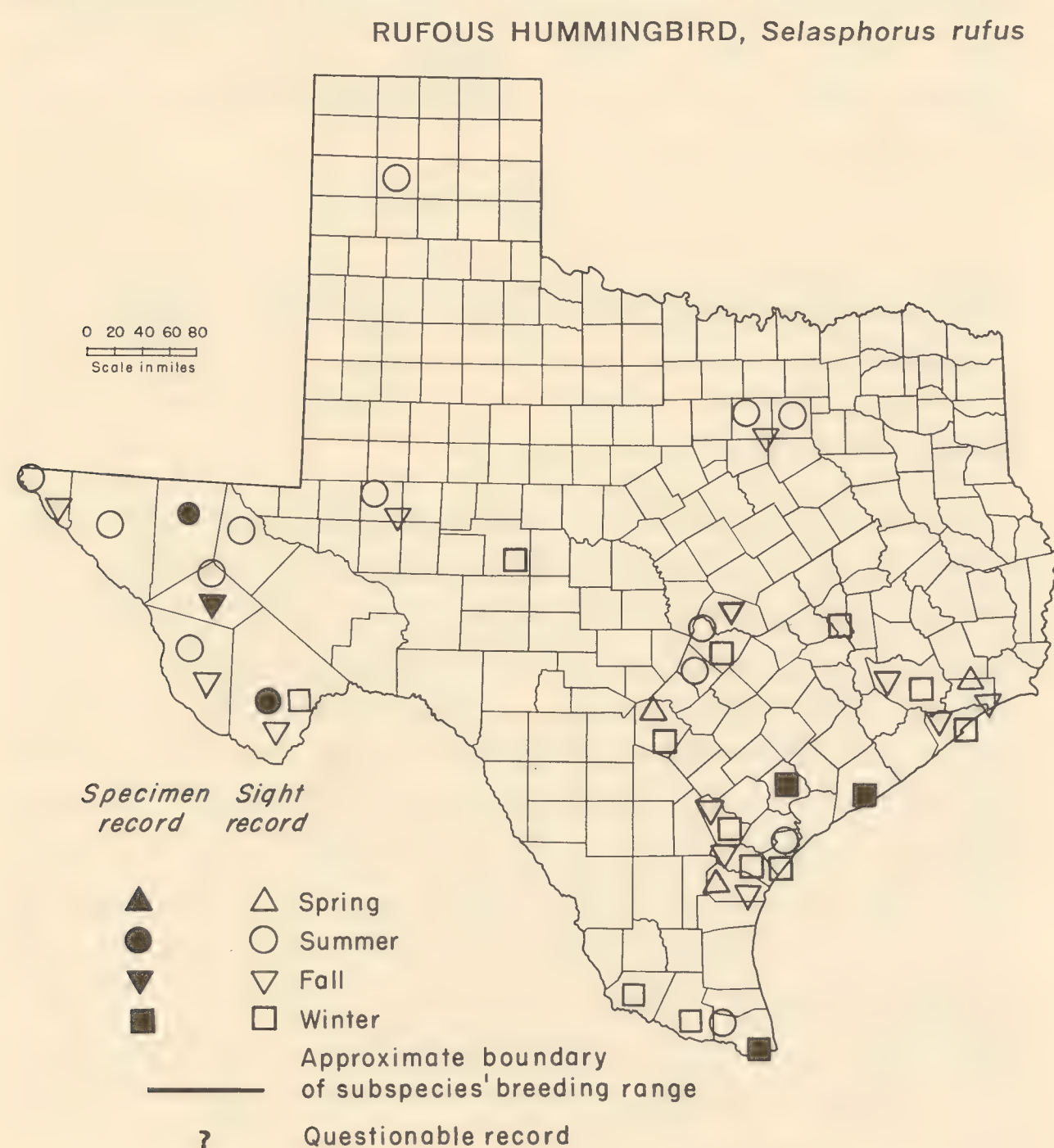
HAUNTS AND HABITS: The Rufous Hummingbird can claim two distinctions. First, it is the northernmost ranging of all hummingbirds; second, the adult male is the only U.S. hummer whose back plumage is pigmented rather than iridescent. On the boreal breeding grounds, the female Rufous secludes her beautiful cupped nest of willow fibers, spider webs, mosses, and lichens in vines and roots of upturned trees or on a low, drooping branch of a conifer. In highland west Texas, as elsewhere in western United States, this bird is usually the most numerous migrant of its family. It is particularly conspicuous in August when a single flowering mountain meadow in the Southwest may harbor two hundred or more Rufous Hummingbirds.

Flight is swift and agile, involving many intricate evolutions. The Rufous, like other hummers, is quite pugnacious about its nest, feeder, or flowering plant. It sips nectar and tiny insects from *Salvia*, *Aquilegia*, *Penstemon*, *Delphinium*, *Bouvardia*, and many other highland plants; it also uses such desert hummer favorites as *Agave* and tree tobacco (*Nicotiana glauca*).

Chief vocalization of the Rufous is a high, sharp *bzee*. Individuals also utter other squeaky notes. Even migrants squeak when they are feeding.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: Adult male, nuptial plumage: Acquired by wear from winter plumage. Crown and forehead dull metallic bronze or bronzy green; small postocular spot white; sides of head and remainder of upper surface between tawny and chestnut; tail mostly same color, middle portion of terminal half with stripe of purplish fuscous; wing-quills fuscous with slight purplish or greenish sheen; wing-coverts metallic dull bronzy green; chin and throat metallic orange-red, changing to golden green; jugulum buffy white; breast and abdomen cinnamon buff; sides and flanks tawny or chestnut like upper parts; tufts on sides and flanks pure white; lower tail-coverts whitish basally, terminally dull cinnamon. Bill dull black; iris dark brown; feet dull brown or black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but pileum more broadly edged with cinnamon or rufous, thus appearing duller. *Adult female, nuptial*: Acquired by wear from winter. Upper parts metallic, but rather dull bronzy green, somewhat duller on pileum; middle pair of tail feathers metallic bronzy green, slightly tipped with cinnamon buff, the webs broadly margined basally with tawny; next to middle pair of rectrices without subterminal notches on inner webs, wholly tawny on basal half succeeded by narrow zone of metallic green with broad subterminal pur-



plish black bar and tipped with buffy white; three outer pairs of rectrices similar, but less metallic green separates blackish area from tawny bases; wing-quills fuscous with metallic purplish sheen; wing-coverts metallic green like back; short postocular streak white; sides of neck similar to upper surface; chin and throat dull white or dull buffy white, most feathers of throat subterminally spotted with dull bronzy green, a number of them spotted with metallic orange-red; remainder of lower parts dull white or buffy white; sides and flanks dull tawny; crissum cinnamon rufous; tufts on sides and flanks pure white. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female, but upper surface more broadly edged with rufous. *Male, second winter*: Acquired by complete postnuptial molt. Similar to first nuptial male, but pileum more broadly edged with cinnamon or rufous, thus duller. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult male, with second pair of tail feather from middle with subterminal notches, but back more or less extensively metallic green. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to adult female in winter in having no notches on next to middle pair of tail feathers, but size smaller; upper tail-coverts largely tawny or chestnut; middle pair of tail feathers dark tawny with subterminal portion bronzy green, sometimes partly blackish, white tips of lateral feathers smaller, and tawny parts deeper and more extensive; feathers of throat much more heavily streaked and spotted with dull metallic green, metallic bronzy, or bronzy green. *Female, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult female, but throat having very few metallic red feathers. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to adult female in winter, but feathers of upper parts obscurely and narrowly tipped with pale dull cinnamon or buff; chin and throat spotted or streaked with dark bronzy green. Similar to first winter male but larger; upper tail-coverts with much less tawny or chestnut edging; throat less heavily spotted or streaked metallic green. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but bill at first decidedly shorter; upper surface more heavily edged with rufous; no metallic red feathers on throat; sides and flanks duller, somewhat more pinkish. *Female, juvenal*: Acquired by postnatal growth. Similar to first winter female, but bill at first decidedly shorter; upper surface duller, more broadly edged with cinnamon or dull rufous; sides and flanks duller, more pinkish.

MEASUREMENTS: *Adult male*: Wing, 38.1–41.4 (average, 40.1) mm.; tail, 25.9–28.9 (27.7); bill (exposed culmen), 15.0–17.5 (16.5). *Adult female*: Wing, 42.9–45.0 (44.2); tail, 24.4–27.9 (26.2); bill, 17.0–19.0 (18.0).

TEXAS: *Migration*: Collected in El Paso, Culberson (Aug. 20), Jeff Davis, and Brewster (July 29) cos. *Winter*: Three specimens: Matagorda Co., Matagorda (Dec., 1937, H. H. Kimball); Victoria Co., Victoria (Jan. 19, 1970, K. A. King; donated to Welder Wildlife Refuge); Cameron Co., Brownsville (Jan. 19, 1892, F. B. Armstrong).

[ALLEN'S HUMMINGBIRD, *Selasphorus sasin* (Lesson)]

Formerly named *Selasphorus alleni*. Similar to the Rufous Hummingbird, *S. rufus*, but smaller and with rectrices much narrower (outermost much less than 2.5 mm. wide in adult male, not more than 2.5 wide in adult female); adult male with upper parts (except upper tail-coverts and tail) metallic bronze green (instead of cinnamon rufous), and rectrices next to middle pair tapering gradually, without notch or sinuation near tip (description from Robert Ridgway, 1911, *Bull. U.S. Nat. Mus.*, no. 50, pt. 5, p. 609). Consideration of the above characteristics with the bird in hand, and

preferably in direct comparison with correctly labeled museum specimens, remains the only way to diagnose Allen's Hummingbird with certainty.

On the breeding grounds (far removed from Texas) some old males of *S. sasin* can be identified by their fully developed fiery red gorgets and glittering green backs; other males resemble subadult Rufous males. The courtship flight of the male Allen's is a lopsided pendulum, resembling a fish hook in shape; *full-blown* aerial display of the male Rufous is a closed ellipse. Female and young Allen's Hummingbirds cannot be distinguished in the field from their *S. rufus* counterparts. Length, 3¾ in.; wingspan, 4¼.

RANGE: Coastal districts of California south to Ventura Co.; resident on Channel Islands off southern coast. Mainland race winters in w. and c. Mexico.

TEXAS: *Hypothetical*: No specimen or photograph of certain identity. Numerous reports on and near upper and central coast; a few inland. A dead hummingbird of the genus *Selasphorus* was found by P. R. Lenna on the campus of Trinity University in San Antonio, Bexar Co., on Dec. 13, 1957. After careful examination, including measurements of the tail feathers, the bird was tentatively identified by Lenna as an adult female or immature male Allen's; most unfortunately it was inadvertently thrown out with the trash before final disposition was possible.

Following are some of the more painstaking sight observations of live birds: Harris Co., Baytown (1 immature male which attained adult plumage by latter date, Nov. 26, 1970–Mar. 7, 1971, Nettie Busby and at least 30 other observers; for details see *American Birds* 25 [1971]: 602); Harris Co., La Porte (immature male which attained adult plumage before departure, Nov., 1968–Apr. 16, 1969, Linda Snyder; see also *American Birds* 25: 602); Aransas Co., Rockport (3 adult males, Sept. 9–13, 1956, Connie Hagar, et al.); Travis Co., Austin (adult male, Oct. 28, 1962, Margaret Louise Hill, Anne LeSassier).]

CALLIOPE HUMMINGBIRD, *Stellula calliope* (Gould)

SPECIES ACCOUNT

Smallest regular U.S. bird. A tiny hummer with relatively short bill; folded wings extend beyond short tail. *Male*: long, metallic gorget feathers (capable of being distended) form purple-red streaks on white throat; bronzy green above; white below with buffy sides. *Female*: resembles larger female Rufous, but lacks metallic red spots on posterior throat; has less rufous in shorter, darker tail; and is less richly washed below (notably on crissum). Length, 3¼ in.; wingspan, 4¼.

RANGE: C. British Columbia and s.w. Alberta, south through mountains to n. Baja California, Nevada, Utah, and Wyoming; also probably in Guerrero, Mexico. Winters in Mexico, south to c. highlands and Guerrero.

TEXAS: *Migration*: Chiefly Aug. (extremes: July 25, Sept. 14). Rare in fall at El Paso; also reported from Chisos Mts., Big Bend Nat. Park (1 male, upper Boot Canyon, 6,500 ft., Aug. 7, 1969, R. H. Wauer), Davis Mts., Fort Davis (1 seen, early Aug., 1971, Pansy Espy), and Midland Co., Midland (2 birds, Sept. 13–19, 1972, Georgia Porter, et al.; represents second record from Midland). See detailed account for specimen evidence.

HAUNTS AND HABITS: The tiny Calliope Hummingbird is quite a mountaineer. It summers—often almost to timberline—in open coniferous and mixed forests and scattered groves on slopes and in canyons. The nest is built and tended entirely by the female, as is the case in nearly all hummers. It is a wee cup of shredded bark, plant fiber, lichens, and spider webs secured low in a tree or bush on a small limb or pine cone. The female is found in the forest more often than the male; occasionally she joins him to feed in flowering meadows. The few Calliopes which migrate through Trans-Pecos Texas typically wander along streams on mesas or in broad valleys where fringes of timber or tall thickets are present.

Calliope flight is swift and direct and long sustained during the bird's migrations. In mountain meadows, forest edge, and understory, this hummer dashes about blossoms of columbine (*Aquilegia*), sage (*Salvia*), paint brush (*Castilleja*), *Penstemon*, and other flowering plants where it eats nectar and tiny insects.

As it feeds, the Calliope Hummingbird utters a light *tsip*. Its various chips and squeaks are fainter and more lisping than those of other U.S. hummers.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN CALLIOPE HUMMINGBIRD, *Stellula calliope calliope* (Gould)

No races recognized by A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts rather dull metallic dark green with bronzy mixture or sheen; tail feathers spatulate, purplish black, more or less grayish at tips, most with obscure narrow edgings of cinnamon at base; wing-quills dull purplish black; upper wing-coverts metallic green like back; chin and throat metallic solferino or aster purple terminally, anteriorly with white bases that show through in places; malar streak dull white; jugulum and upper breast white; middle of breast and middle of abdomen dull buffy grayish white; sides more strongly suffused with buff and overlaid with metallic dark green; lower tail-coverts dull white, basally somewhat buffy; tufts on sides and flanks pure white. Bill black above; mandible yellowish or flesh color at base; iris dark brown; feet dull black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Metallic green above, somewhat duller and more bronzy than male; middle pair of tail feathers dull bronzy green, the tips more or less purplish black; next to middle pair similar but with longer dark tip and basal portion edged with cinnamon buff; next pair similar but with more extensive black and with white spot at tip; two outermost feathers similar but with broad white tips; anterior lower parts white or buffy white, throat having some small spots of dull bronzy; breast, sides, and flanks cinnamon or cinnamon buff; lower tail-coverts white, more or less tinged with cinnamon buff; tufts on sides and flanks pure

white. *Adult female, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adult female. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult male, but lower throat and often remainder of under parts more buffy; gorget shorter, thinner, and more reddish (less violet)—nearer amaranth purple than aster purple or solferino which are gorget colors of adult male. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to adult female in winter, often with some metallic purplish feathers on throat, but throat usually more heavily spotted bronzy green; upper surface duller, feathers with more or less evident edgings of dull grayish buff or dull cinnamon. *Female, first nuptial*: Acquired by complete prenuptial molt. Like nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to nuptial adult female, but upper parts usually more bronzy, feathers obscurely tipped with dull brown or grayish buff; throat somewhat more spotted with dull bronze or brown. Similar to male in first winter but larger; brownish or bronzy spots on throat smaller or less numerous. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but bill shorter; upper surface duller, light buffy tips of feathers broader. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but spots on throat smaller or less numerous.

MEASUREMENTS: *Adult male*: Wing, 37.1–39.9 (average, 38.9) mm.; tail, 19.6–20.6 (20.1); bill (exposed culmen), 13.5–15.0 (14.2). *Adult female*: Wing, 40.9–43.9 (42.7); tail, 20.1–22.6 (21.6); bill, 15.0–16.0 (15.7).

RANGE: Identical with that of species with exception of Guerrero, Mexico. Winters chiefly from Sinaloa and Aguascalientes to Guerrero.

TEXAS: *Migration*: One specimen: El Paso Co., El Paso (exact date unknown, 1853, J. H. Clark). Originally recorded as Heloise's Hummingbird, *Atthis heloisa*; specimen examined by H. C. Oberholser.

RIVOLI'S HUMMINGBIRD, *Eugenes fulgens* (Swainson)

SPECIES ACCOUNT

Also known as Magnificent Hummingbird. A large, dark (male may appear all black) hummer with relatively slow, discernible wing-beats. *Male*: metallic bronzy green above with metallic purple crown and white spot behind eye; brilliant emerald green throat; blackish breast, belly; grayish crissum; well-notched, dull green tail with no white. *Female*: bronzy green above with a white postocular streak; grayish below with dusky throat-spots; almost square-tipped, largely dull green tail with obscure whitish corners. Length, 5½ in.; wingspan, 7.

RANGE: S.e. Arizona, s.w. New Mexico, and Trans-Pecos Texas, south through highlands of Mexico and Central America to w. Panama. Winters in Mexico and Central America.

TEXAS: *Summer* (perhaps breeds, but no actual nesting evidence available): Early Apr. to late Sept. from 6,000 to 7,600 ft. Uncommon to scarce in Chisos Mts., Big Bend Nat. Park. One specimen (race as yet undetermined) from Culberson Co., McKittrick Canyon, 5,300 ft. (female with well-developed incubation patch, ovarian follicles 2 mm., June 6, 1972, G. A. Newman; original no., 280). *Migration*: Mar. 30 to May 26, probably into June; early Sept. to Oct. 12. Uncommon at high altitudes (rare below 6,000 ft.) in Chisos Mts.;

accidental at San Antonio (1 male, May 24–26, 1959, C. R. Bender, Mr. and Mrs. G. B. Harding).

HAUNTS AND HABITS: The male Rivoli's Hummingbird is the more brilliant of the two large hummers of the mountainous U.S.-Mexico border. The Bluethroat's comparatively small gorget usually seems reluctant to light up, but the Rivoli's purple and green head flashes readily. This hummer frequents high fir-pine-juniper oak forests and bushy flowering vegetation of slopes, canyons, and valleys; it is less restricted to streamsides than is the Bluethroat. In shady, secluded woods the female secures the delicate but sturdy cupped nest, covered with moss and lichens, on a horizontal limb of a tree. Rivoli's often perches midway up in tall conifers. Such evergreens are rare near the Rio Grande, which probably explains the scarcity of this bird in Texas.

Flight of this large, heavy-bodied hummingbird is slower than that of its small relatives, and the noise produced by the fewer wing-beats is less sharp. Occasionally the Rivoli's glides on set wings in a swiftlike manner. The species generally seems less dependent on flowers than are most other hummers. In addition to nectar sipping at agaves and other blossoming plants, the bird gleans insects from foliage of pines and other trees, as well as from flowers, and catches gnats and flies on the wing. This hummer is no more belligerent at a blossom or feeder than other trochilids, but because of its large size, it tends to dominate its neighbors.

The sharp *chip* note of the Rivoli's Hummingbird, uttered at intervals from a perch or more rapidly on the wing, is like that of the Black Phoebe. The phoebe is much more frequently heard in Texas than this hummer.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN RIVOLI'S HUMMINGBIRD, *Eugenes fulgens fulgens* (Swainson)

Race not in A.O.U. check-list, 1957.

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Tail deeply emarginate; pileum metallic royal purple or violet; forehead slightly blackish; postocular spot white; hindneck, sides of head, auriculars, and rest of upper surface bronzy green or metallic golden green; tail similar but rather duller; wing-quills rather dark fuscous with metallic purplish sheen; upper wing-coverts like back; throat metallic emerald green; jugulum and upper breast dull black and metallic green much like upper surface, in some positions changing to dull black; abdomen and flanks dull brown—between hair brown and buffy brown; tufts on thighs and sides of anal region pure white; crissum light grayish olive with slight greenish sheen; lining of wing metallic green like upper parts. Bill dull black, but basal part of cutting edges flesh color; iris dark brown or blackish brown; feet dull brown or blackish brown; claws similar. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Tail double-rounded or only slightly emarginate; upper parts bronzy green; pileum dark grayish brown, sometimes dull on forehead; tail like back, all rectrices—except middle pair—with broad bluish black subterminal band and broad grayish white tip; wings dull fuscous

with purplish sheen; upper and lower wing-coverts metallic green like back; postocular streak dull white; auriculars mostly fuscous black; lower surface pale brownish gray, sometimes with buffy tinge, feathers of chin and throat having darker gray or dull buff centers; sides and flanks spotted metallic green like back; tufts on thighs and sides of anal region pure white; under tail-coverts dull smoke gray, edged with paler gray or dull white. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial:* Acquired by complete prenuptial molt. Like nuptial adult male. *Male, first winter:* Acquired by partial postjuvenile molt. Similar to adult female in winter, but crown partially violet; throat and breast partially green; jugulum somewhat mixed with black; tail intermediate between that of nuptial adult male and nuptial adult female. *Female, first nuptial:* Acquired by complete prenuptial molt. Like nuptial adult female. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to adult female in winter, but feathers of upper parts dull and narrowly margined with very pale buff, buffy white, or pale grayish white; lower parts darker and duller, more suffused with dull light brown. Cutting edges of bill more extensively flesh color basally; legs and feet light brown. *Juvenal:* Unknown. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 69.6–75.9 (average, 72.9) mm.; tail, 40.4–48.0 (43.2); bill (exposed culmen), 25.4–31.0 (27.4). *Adult female:* Wing, 66.5–70.6 (68.8); tail, 37.6–41.9 (39.4); bill, 26.4–29.9 (28.4).

RANGE: Trans-Pecos Texas to Nuevo León, south to Jalisco and Oaxaca.

TEXAS: *Summer* (perhaps breeds): Four specimens from Brewster Co.: Chisos Mts., Boot Spring, 6,800 ft. (adult male in breeding plumage, July 2, 1932, C. H. Mueller); Boot Spring (2 males, July 21, 26, 1955, K. L. Dixon; Texas A&M University collection, nos. 5882, 5883); south side of Mt. Emory, 6,800 ft. (adult female, June 25, 1937, T. F. Smith). See species account for Culberson Co. specimen.

NESTING: *Nest:* Usually in woodlands, canyons, or on slopes; saddled on branch of tree or bush, such as maple, sycamore, walnut, or Douglasfir, about 10–35 ft. above ground; well-built cup of grass tops and soft silky plant fibers, decorated on outside with lichens; lined with sycamore or other fine plant down and feathers. *Eggs:* 2; elliptical oval to oval, sometimes inclining to elliptical ovate; pure white, without markings; average size, 16.5 × 10.2 mm.

BLUE-THROATED HUMMINGBIRD, *Lampornis clemenciae* (Lesson)

SPECIES ACCOUNT

A large hummer with bold white corners on its big (ample and broad) blue-black tail; wing-beats discernible. *Male:* metallic green above; two white streaks near the eye (one above and behind, another below); uniform gray below with a blue gorget. *Female:* similar but has solid gray throat. Length, 5 in.; wingspan, 7½.

RANGE: S.e. Arizona, extreme s. New Mexico, and Trans-Pecos Texas, south through highland Mexico to Oaxaca and Chiapas. Winters chiefly in Mexico.

TEXAS: (See map.) *Summer* (very likely breeds, but no actual nesting evidence available): Early Apr. to mid-Sept. from 5,000 to 7,600 ft. Fairly common (chiefly Boot Canyon) to uncommon in Chisos Mts., Big Bend Nat. Park; scarce in Guadalupe Mts. *Migration:* Mar. 18 to May 22; Aug. 18 to Oct. 24. Fairly common

in Chisos Mts.; rare at El Paso and along Rio Grande in Brewster Co. (Lajitas, Boquillas); casual at Houston (Aug. 18–20, 1968, Bill McClure), Rockport (female, Apr. 18–20, 1956, Connie Hagar, et al.; one previous sighting, fide Hagar), Santa Ana Nat. Wildlife Refuge (male, Oct. 23–24, 1966, J. C. Arvin, R. J. Fleetwood, Pauline James), and Port Isabel (female, Oct. 30–31, 1971, Arvin). *Winter*: Sightings: Brewster Co., along Rio Grande near mouth of Tornillo Creek (3 birds, Dec. 25, 1934; 7 birds, Dec. 23, 1935–Jan. 4, 1936, Lovie Whitaker).

HAUNTS AND HABITS: The Bluethroat is the only U.S. hummer in which the adult male has white in his tail. It almost seems as though the female is so plentifully supplied with white in her tail that a good bit of it even carries over to the male! This large hummingbird is at home in streamside vegetation of desert mountains. Boot Canyon in the Chisos Mountains of Big Bend National Park is its chief Texas haunt. Here, especially near Boot Spring, it perches on twigs of Arizona cypress (*Cupressus arizonica*), various oaks, and bigtooth maple (*Acer grandidentatum*). Frequently in spring and summer it wings out over canyon slopes where it hovers at *Agave* blossoms to sip nectar and eat spiders and small insects. At this time its ample—for a hummer—tail dangles downward, well displaying the conspicuous white corners. Sometimes it picks insects from leaves.

Flight of the Bluethroat is swift, strong, and capable of being well sustained. Usually its wings produce a more or less perceptible hum; at times, however, wing movement is silent, less rapid, and very much like that of a swift. When perching, it often remains for several minutes absolutely motionless or turns its head in a

sidewise fashion; in this stance the bird appears fat necked and resembles a wee sea lion!

The ordinary note of this hummingbird is a loud, sharp, squeaky *seek* or *seep* sometimes uttered in a series, which is heard either when the bird is perched or on the wing. *Seeping* from a perch in spring and summer probably has a territory-proclaiming effect, although birds squeak in flight all year.

DETAILED ACCOUNT: ONE SUBSPECIES

TEXAS BLUE-THROATED HUMMINGBIRD, *Lampornis clemenciae* phasmorus Oberholser, new subspecies (see Appendix A)

DESCRIPTION: *Adult male, nuptial plumage:* Similar to nuptial adult male of Mexican Blue-throated Hummingbird, *L. c. clemenciae*, but bill and tail decidedly shorter; white tips of outermost rectrices narrower. Also similar to Arizona Blue-throated Hummingbird, *L. c. bessophilus*, but upper parts more greenish (less brownish or bronzy); lower surface darker and more grayish (less brownish). Acquired by wear from winter plumage. Pileum brownish olive with dull metallic parrot greenish sheen; nape and back metallic olive green or dark green, back somewhat bronzy; rump and shorter upper tail-coverts rather brownish metallic yellowish olive; longer upper tail-coverts and tail feathers bluish black, two outermost pairs of rectrices broadly, third narrowly, tipped with white; wings, including greater and primary coverts, chaetura drab with purplish sheen; lesser wing-coverts metallic green like back; short superciliary stripe and postocular streak white; narrow rictal streak dull white or buffy white; sides of head and neck between fuscous and hair brown, latter glossed with metallic green of back; chin and throat rich metallic blue—between vanderpoel blue and blanc blue; breast and abdomen mouse gray, former washed with metallic green; sides and flanks similar but much overlaid with bronzy green; each flank with pure white tuft; lower tail-coverts dull mouse gray tipped with dull white. Bill dull black; iris dark brown; feet dull brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but upper parts usually more bronzy; lower parts lighter, more brownish; chin and throat similar to remainder of lower parts but more or less tinged with dull cinnamon. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, first nuptial:* Not examined, but probably acquired by complete prenuptial molt. *Male, first winter:* Not seen, but probably acquired by partial postjuvenile molt. *Female, first nuptial:* Not seen, but probably acquired by complete prenuptial molt. *Female, first winter:* Acquired by partial postjuvenile molt. Similar to adult female in winter, but pileum duller; lower parts paler and more brownish, particularly on chin and upper throat which are dull cinnamon. *Juvenal:* Unknown. *Natal:* None. Bird hatched unfeathered.

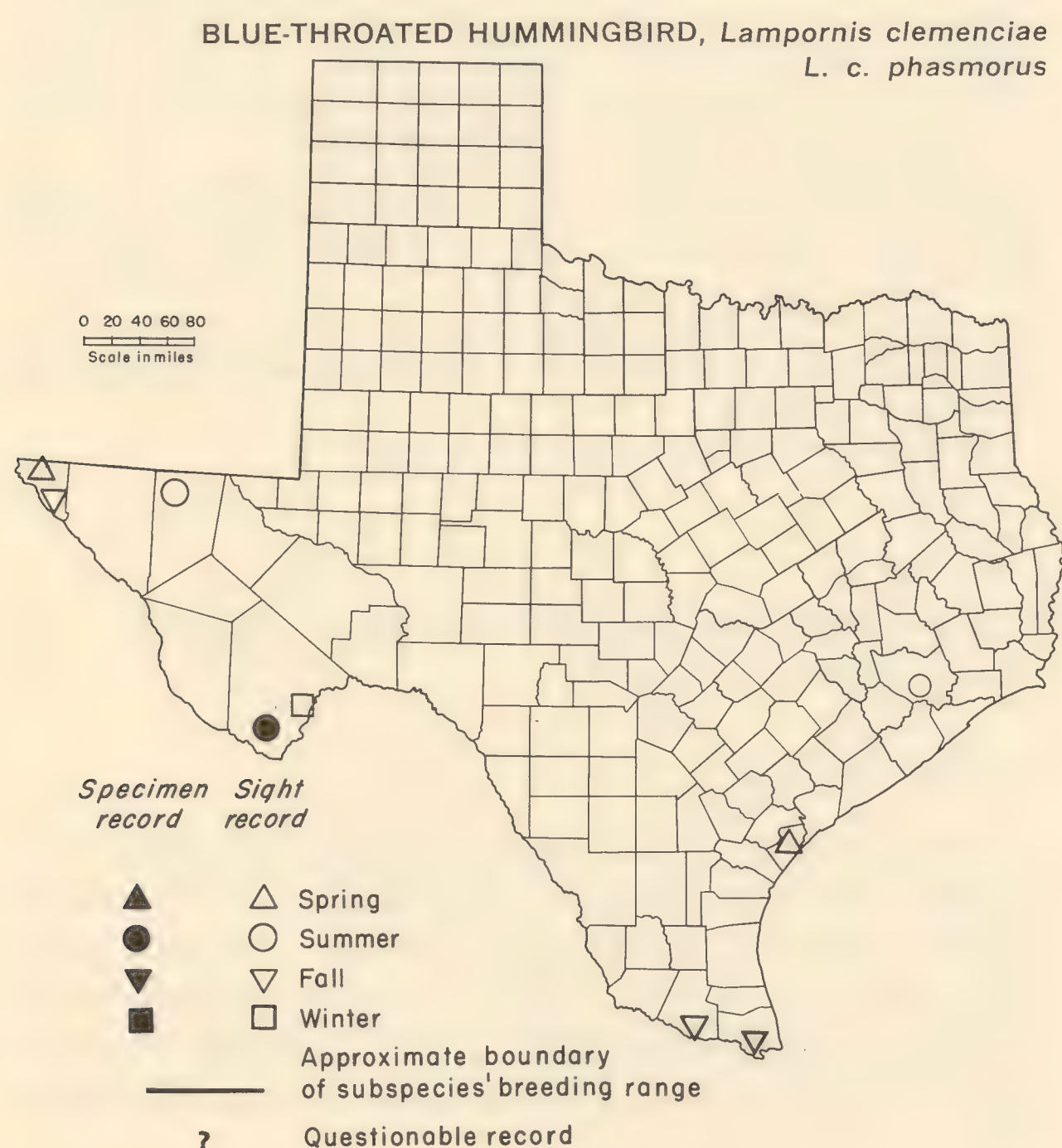
MEASUREMENTS: *Adult male:* Wing, 71.9–77.5 (average, 75.7) mm.; tail, 45.5–51.1 (46.8); bill (exposed culmen), 21.1–22.6 (21.6). *Adult female:* Wing, 68.1–69.1 (68.6); tail, 42.4–42.9 (42.7); bill, 23.1–23.9 (23.6).

TYPE: Adult male, no. 168365, U.S. National Museum, Biological Surveys collection; Pine Canyon, 6,000 ft., northeastern side of Chisos Mts., Texas; June 1, 1901; H. C. Oberholser, original no., 278.

RANGE: Trans-Pecos Texas, south to w. Nuevo León. Winters probably in e. Mexico.

TEXAS: *Summer:* Collected in Chisos Mts., Brewster Co.

NESTING: *Nest:* In mountains on wooded slopes, timber along streams and canyons; on limb of tree or bush; beautiful, rather bulky structure of moss and plant fibers, bound together with



webs of spiders and silk from insect cocoons; lined with vegetable down. *Eggs*: 2; elliptical oval; without gloss; dull white, unmarked; average size, 16.3×9.9 mm.

RIEFFER'S HUMMINGBIRD, *Amazilia tzacatl*
(De la Llave)

SPECIES ACCOUNT

Also known as Rufous-tailed Hummingbird. *Male*: resembles Buff-bellied (see below), but lower breast and belly grayish brown; lores, upper tail-coverts, crissum, and tail (terminally glossed with violet or bronze) chestnut. *Female*: similar to male but duller; green of anterior under parts somewhat mixed with whitish. Length, $4\frac{1}{4}$ in.

RANGE: S. Tamaulipas, south, chiefly in lowlands, through e. and s. Mexico and Central America to w. Ecuador, Colombia (including Isla Gorgona), and w. Venezuela; accidental in extreme s. Texas.

TEXAS: *Accidental*: The first known occurrence of the Rieffer's Hummingbird in the United States was documented by J. C. Merrill; in June of 1876, he examined and described a living individual brought to him by a soldier who reputedly had captured the bird at Brownsville and to whom it was returned. Shortly thereafter, the bird escaped. A second individual obtained in the same locality only a few weeks later in July was identified by Robert Ridgway. There is no indication that the latter bird, if a specimen, was preserved.

One recent sighting of a hummingbird believed to be a Rieffer's: Harris Co., La Porte (Nov. 11, 12, 1969, Linda Snyder, Mr. and Mrs. J. L. Tveten).

HAUNTS AND HABITS: The Rieffer's is often stated to be the most numerous hummer in the lowlands of Panama. Its typical south-of-the-border haunts are cultivated areas—banana plantations and flowering shrubbery about houses—and the edges of clearings in forests. Here in a tree, bush, or vine, the female camouflages the nest of plant fiber, cobwebs, lichens, and moss on a drooping branch or slender stem. In the Caribbean lowlands, nesting occurs at all times of the year.

The bird is active, appears inquisitive, and seems not to be wary of humans. Hovering at or perching on a flaming red hibiscus, long banana blossom, or other flowering plant, the Rieffer's sips nectar and tiny insects. Frequently in early morning, this hummer bathes on a banana leaf by whipping up the dew with its wings.

The chief vocalization of the male Rieffer's Hummingbird, serving territorial and courtship purposes, has been described by A. F. Skutch from his observations in Costa Rica as a pleasant *tse-we ts we*, sometimes several times repeated. This, he noted, is uttered during the rainy season most actively in the dawn hours.

DETAILED ACCOUNT: ONE SUBSPECIES

MIDDLE AMERICAN RIEFFER'S HUMMINGBIRD,
Amazilia tzacatl tzacatl (De la Llave)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper surface metallic dark green with bronzy sheen or mixture, pileum duller and darker; upper tail-coverts and tail chestnut, rectrices terminally glossed with bronze; wings fuscous with metallic purplish sheen, lesser wing-coverts, sides of head and of neck metallic green like back; lores chestnut; chin, throat, and jugulum metallic yellowish emerald green; feathers of chin and upper throat pale buffy white or buff at bases, this color sometimes showing through; abdomen and middle part of breast hair brown; sides and flanks metallic dark green; lower tail-coverts cinnamon rufous; tufts on sides and flanks pure white. Bill dull black or dark brown but basal half of mandible and bare skin of chin orange, dull red, or carmine; iris dark brown; legs, feet, and claws black or dull brown. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but feathers of gorget with pale gray tips. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but green of anterior lower parts more interrupted by whitish bases or feather margins; middle of abdomen paler. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female, but with pale gray tips on gorget feathers. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult male, but gorget feathers not so closely imbricated; feathers on chin and elsewhere show more dull white or buff between metallic feather areas, gorget also not so brilliant or extensive and not reaching so far over sides of neck. Similar to nuptial adult female, but middle of abdomen darker. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial male, but gorget with broader pale gray edgings. *Female, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult female, but differs as does first nuptial male from nuptial adult male, and additionally in somewhat duller pileum. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial female, but gorget with broader pale buff or dull white tips. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but bill at first very much shorter; upper surface duller, pileum and remainder of upper parts having conspicuous broad tawny or russet tips; chin and middle of throat fuscous, without metallic feathers; metallic feathers of lower surface duller. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but middle of abdomen paler.

MEASUREMENTS: *Adult male*: Wing, 53.1–61.0 (average, 56.6) mm.; tail, 29.9–35.1 (32.8); bill (exposed culmen), 18.0–23.1 (20.9). *Adult female*: Wing, 52.1–57.9 (54.8); tail, 29.9–35.1 (32.8); bill, 20.1–23.9 (21.4).

RANGE: S. Tamaulipas, south through e. and s. Mexico and Central America to c. Colombia and w. Venezuela; accidental in extreme s. Texas.

TEXAS: *Accidental*: See species account.

BUFF-BELLIED HUMMINGBIRD, *Amazilia yucatanensis* (Cabot)

SPECIES ACCOUNT

Also known as Fawn-breasted Hummingbird and Yucatán Hummingbird. A rather large hummer; sexes similar. Metallic bronzy green above; emerald green gorget and upper breast; buffy (fawn in southern race) posterior under parts; slightly forked, largely chestnut tail; dusky-tipped red bill. Length, $4\frac{1}{4}$ in.; wingspan, $5\frac{1}{2}$.

RANGE: Coahuila, Nuevo León, and extreme s. Texas, south through lowlands of e. Mexico to Chiapas, Yucatán Peninsula, n. Guatemala, and British Honduras; one Honduras specimen. Northern race winters chiefly in s. Tamaulipas and Veracruz; irregularly north to s. Texas.

TEXAS: (See map.) *Breeding:* Mid-Apr. to mid-Aug. (eggs, Apr. 23 to Aug. 3) from near sea level to about 100 ft. Locally uncommon to scarce (common to fairly common prior to 1951) in Cameron and Hidalgo cos. *Winter:* Oct. to Mar. Scarce and erratic in Cameron and Hidalgo cos.; rare at Welder Wildlife Refuge; casual at Baytown. *Vagrant:* Wanders north, chiefly during nonbreeding season, irregularly to central coast, where scarce to rare; on eastern edge of Edwards Plateau and on upper coast; accidental at Midland (1 sighted, Nov. 10–11, 1964, Ola D. Haynes, Mr. and Mrs. F. B. Kingon, Ellen Sledge).

HAUNTS AND HABITS: This northeasternmost ranging representative of the large tropical genus *Amazilia* inhabits semiarid coastal scrub from the base of the Yucatán Peninsula to the Rio Grande delta.

The bird's favored haunts are dense thickets, flowering bushes, and creeping vines along streams, resacas, and gullies. Here on whirring wings it swiftly flashes through the tangles or hovers before a blossom while feeding on nectar and insects. Some native flowers at which it feeds in spring and summer are those of Texas ebony (*Pithecellobium flexicaule*), mesquite (*Prosopis glandulosa*), and anaqua (*Ehretia anacua*); in fall and winter the brilliant red blossoms of giant Turk's cap (*Malvaviscus grandiflorus*) are favored by this and other hummingbirds, especially the Ruby-throated and Rufous. In the vicinity of a flowering Turk's cap bush,

the comparatively large Buffbelly tends to dominate its smaller kin. Between forays, this hummer is more likely to rest in the shady interior of a dense thicket than are most of its relatives.

Somewhat difficult to glimpse in its thornbrush habitat, the Buff-bellied Hummingbird often first reveals its presence with a rapid fire of shrill, squeaky notes. Individuals are vocal throughout the year, especially when defending a feeding territory.

CHANGES: In 1951, the Rio Grande delta, though already 90 percent cutover, was otherwise relatively pristine. Since the devastating freeze of January 29–February 1, 1951, the dominant delta crop has switched from little-sprayed citrus to cotton, which is repeatedly drenched with pesticides and herbicides. This increased usage of agricultural chemicals, along with continued brush clearance, has been the chief depressants of practically all small mammals and birds native to the delta, including the Buff-bellied Hummingbird.

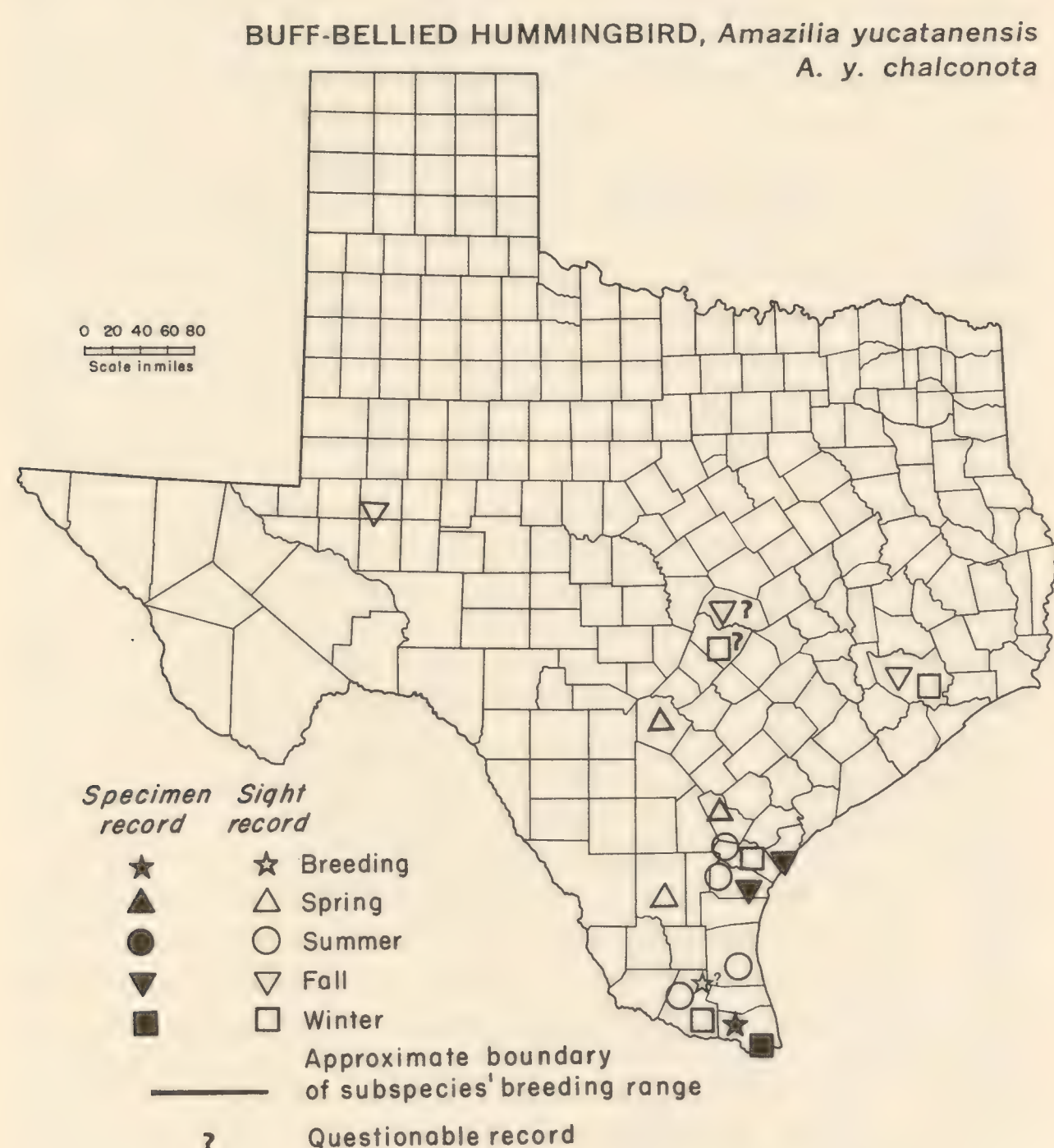
In 1971, 307,400 acres of this four-county area (Wilbacy, Cameron, Hidalgo, and Starr) were planted to cotton. Furthermore, citrus has made somewhat of a comeback (about 80,000 acres planted here in 1971). Also, increased plantings to vegetables, grain sorghum, and pasture grasses are making further demands on available delta land, as is ongoing construction of roads and houses.

Despite continued pollution and destruction of habitat, some Buffbellies still cling to the few remnant palm (*Sabal texana*) patches on the southern outskirts of Brownsville. During the breeding season of 1968, J. C. Arvin, long-time bird observer in the area, reported the species as numerous in Southmost palm grove; on April 24 of that year he noted ten birds. In the course of an Audubon Christmas Bird Count at the same place on December 29, 1970, counters found six of these hummers, which was an all-time winter high for the species in the United States (E. B. Kincaid, Jr., et al.).

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN BUFF-BELLIED HUMMINGBIRD, *Amazilia yucatanensis chalconota* Oberholser

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear from winter plumage. Upper surface bronzy green, cervix less golden, forehead and crown duller, more brownish or grayish; feathers of upper tail-coverts edged with chestnut; tail chestnut, the two central feathers greenish bronze, all others externally margined and tipped (outer ones narrowly, inner broadly) with same color; wings dull dark purplish black with somewhat greenish sheen, lesser wing-coverts bronzy green like back; chin, throat, and breast bright metallic yellowish emerald green; posterior lower parts ochraceous buff; lower tail-coverts, sides, and flanks somewhat darker, approaching cinnamon rufous and mixed on sides with metallic bronzy green; lining of wing metallic bronzy green; edge of wing cinnamon rufous; tufts on sides and flanks pure white. Bill rosy red, tip dark brown; iris dark brown; feet dull brown. *Adults, winter:* Acquired by complete postnuptial molt. Similar to nuptial adults. *First nuptial:* Acquired by complete prenuptial molt. Similar to nuptial adults, but chin, throat, and jugulum duller, feather edgings buff or



buffy white, metallic gorget duller, less extensive, and chin with more white showing between metallic portions of feathers. *First winter*: Acquired by partial postjuvenile molt. Similar to first nuptial male and female, but pileum darker and duller; edgings of chin, throat, and jugulum dark buff. *Juvenal*: Acquired by postnatal growth. Similar to first winter male and female, but bill at first decidedly shorter; upper surface generally duller, feathers edged with cinnamon or tawny, this edging particularly conspicuous on pileum, lower back, and rump; edgings of anterior lower surface deeper buff, more inclining to cinnamon or tawny. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 52.6–58.9 (average, 55.6) mm.; tail, 32.0–37.6 (34.0); bill (exposed culmen), 20.1–21.6 (20.9). *Adult female*: Wing, 52.6–55.6 (53.1); tail, 29.9–35.1 (32.8); bill, 20.6–22.6 (21.4).

RANGE: Coahuila, Nuevo León, and extreme s. Texas, south to s. Tamaulipas and n.e. Veracruz. Winters from extreme s. Texas (irregularly) to s. Veracruz.

TEXAS: *Breeding*: Collected (many skins and eggs) in Cameron Co. *Winter*: Two specimens: Cameron Co., Brownsville (Jan. 1, 9, 1890, F. B. Armstrong). *Vagrant*: Three specimens: about 25 mi. northeast of Beaumont, probably Orange Co. (first seen, Nov. 28, 1968, found dead, Dec. 1, 1968; in Houston Museum of Natural Science collection, fide W. J. Graber); Aransas Co., Aransas Nat. Wildlife Refuge (Nov. 14, 1939, J. O. Stevenson); Nueces Co., Corpus Christi (Oct. 25, 1891, W. Lloyd).

NESTING: *Nest*: In open woodlands, brush, often about margins near roads or trails, or citrus groves; not far above ground, in bush or tree, on small drooping limb or horizontal fork of twig; cup small or relatively large and heavily built, composed of shreds of bark, bits of weed stems, grass, silky vegetable fibers; covered on outside with shreds of bark, bits of flower blossoms, and lichens and fastened with spider and insect webs; lined with thistle or other fine vegetable down. *Eggs*: 2; elliptical oval or oval; white, unmarked; average size, 13.2×8.6 mm.

WHITE-EARED HUMMINGBIRD, *Hylocharis leucotis* (Vieillot)

SPECIES ACCOUNT

Both sexes have a bold white postocular arc and a black-tipped red bill. *Male*: largely metallic green above and below; metallic violet forehead, anterior crown, and chin; square-tipped tail; whitish crissum. *Female*: greenish above and on flanks; mostly whitish below with green spots on throat. Length, $3\frac{1}{2}$ in.

RANGE: Sonora, Chihuahua, San Luis Potosí, and Tamaulipas, south, chiefly in highlands, through Mexico to Nicaragua; casual summer resident in mountains of s.e. Arizona. Northern races winter in Mexico and Guatemala.

TEXAS: *Summer*: Casual visitor to Chisos Mts., Big Bend Nat. Park, where lone individuals have been found along trail to Boot Spring (see detailed account), near South Rim (July, 1953, Harold Schaafsma), at Boot Spring (Apr. 27, 1963, Phil Allen, Anne LeSassier), and along north slope below Emory Peak (July 17, Aug. 13, 1967, R. H. Wauer).

HAUNTS AND HABITS: The brilliant White-eared Hummingbird is the standard small hummer of pine-oak forests and shrubby, flowery stream banks in the high sierras of Mexico and Central America. Here, usually in a brushy clearing, the female builds a shallow-cupped nest ornamented with lichens and moss, securing it to a slender branch of a bush or small tree. The

species occurs only casually in the southwestern United States where it seeks situations similar to its Mexican haunts.

The precision flight and pugnacious behavior of this bird are typical of the family. Often joining other hummers, White-ears cluster around an agave, scarlet bouvardia, or other flowering plant where, in between bickering and sparring, they sip nectar and eat insects. Unlike hummingbirds in general, which are reputed to prefer red, the White-ear is strongly attracted to blue flowers, especially those of *Salvia mexicana*.

Vocalizations of the White-eared Hummingbird have been described as very high pitched staccato notes. A common territorial call of the male is a low, clear, bell-like *tink tink tink*. One must travel south of the border to be sure of hearing this lively hummer.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN WHITE-EARED HUMMINGBIRD, *Hylocharis leucotis borealis* Griscom

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Forehead and anterior part of crown metallic deep blue violet to lyons blue; occiput and hindneck metallic warbler green or metallic yellowish oil green to metallic medal bronze, remaining upper surface of same greens to grass green or more bluish green or mixture of all, upper tail-coverts more or less tinged with bronze, their tips russet to tawny; tail metallic dull violet black, middle feathers metallic citrine, some of other feathers tipped with same color and with bronzy outer margins; wings dark grayish brown to dark vinaceous drab, lesser and median upper wing-coverts metallic green like back; sides of head dull black with broad white postocular stripe extending to sides of neck; lores and chin deep blue violet to lyons blue; throat metallic yellowish emerald green to vivid green; remainder of lower parts, including lining of wing, similar to upper surface but lighter, feathers narrowly tipped with dull brown or buffy, middle of abdomen and crissum tipped and margined with dull buff or dull white, the latter very broadly; flanks with small white tufts. Basal half or two-thirds of bill coral red, remaining portion brownish black; iris dark brown; legs and feet dark brown. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but whitish edgings of posterior lower surface broader. *Adult female, nuptial*: Acquired by wear from winter. Upper surface similar to nuptial adult male, but pileum dull olive brown with little or no metallic luster; wings and tail similar to those of nuptial adult male, but outer pair of tail feathers broadly tipped with light drab; broad white postocular stripe as in male; broad suborbital and auricular stripe or patch dull black; lower surface pale dull buff, buffy white, or grayish white, much spotted with metallic green of upper surface, these spots more or less coalescing laterally; flanks much mixed with dull cinnamon; feathers of crissum with dull yellowish metallic green or dull brown centers or shaft stripes. Maxilla brownish black, mandible light reddish basally, terminal portion dull dark brown; iris dark brown; legs and feet dull brown. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female, but feathers of pileum with tawny tips; metallic feathers of lower surface somewhat obscured by dull white or buffy tips. *Male, second nuptial*: Acquired by wear from second winter. Similar to nuptial adult male, but metallic feathers of face and gorget duller and less extensive. *Male, second winter*: Acquired by complete postnuptial molt. Similar to second nuptial male, but light edgings of posterior lower surface broader. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to second nuptial male, but metallic feathers of face and gorget still duller and less extensive. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to

adult female but larger, somewhat darker, and with some black or violet feathers in crown or on throat. *Female, first nuptial*: Acquired by complete prenuptial molt. Like nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to adult female in winter, but pileum duller, more bronzy, the feathers with broader tawny tips; upper parts usually more bronzy, the feathers with tawny tips; lower surface more buffy. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but bill shorter; pileum duller, bronzy olive with no metallic feathers; lower surface duller, more buffy, with few or no metallic feathers on throat. *Female, juvenal*: Acquired by postnatal growth. Similar to first winter female but duller; pileum, as well as rump and upper tail-coverts, with very broad tawny to ochraceous tawny edgings; fewer metallic feathers on lower surface.

MEASUREMENTS: *Adult male*: Wing, 55.1–57.4 (average, 56.1) mm.; tail, 32.0–36.1 (33.8); bill (exposed culmen), 16.5–18.0 (17.3). *Adult female*: Wing, 52.1–53.6 (53.1); tail, 29.9–32.5 (31.5); bill, 16.5–18.0 (17.3).

RANGE: Highlands (chiefly) of n.w. Mexico, south along both slopes of Sierra Madre Occidental to n. Sinaloa and n. Durango; also reported from Sierra Madre Oriental of w. Tamaulipas; casual summer resident in s.e. Arizona. Winters in n.w. Mexico.

TEXAS: *Summer*: One specimen: Brewster Co., Chisos Mts., Boot Spring trail between Laguna Meadow and Boot Spring (July 7, 1937, T. F. Smith).

BROAD-BILLED HUMMINGBIRD, *Cynanthus latirostris* Swainson

SPECIES ACCOUNT

Male: metallic green (may appear black) above and below with broad, black-tipped red bill; metallic blue throat; forked tail; dull white crissum. *Female*: metallic green above; unmarked gray below (including throat); reddish-based dark brown bill; square-tipped tail. Length, 4 in.; wingspan, 5.

RANGE: S. Arizona, extreme s.w. New Mexico, s.w. Texas (rarely) and Tamaulipas, south through arid regions of Mexico to Chiapas (on Pacific slope) and n. Veracruz. Winters in Mexico.

TEXAS: Apparently no extant specimen or photograph; however, this relatively easy-to-identify species has been studied repeatedly in good habitat by skilled observers. *Breeding*: Early May to early Aug. (nest with eggs located, Johnson Ranch about 8 mi. southeast of Castolon, May 17, 1934, R. W. Quillin; adult on nest near Alpine, June 15–25, 1940, nest with 2 young, Boquillas, July 21, 1940, Lena McBee; adult feeding young, Hot Springs, July 26–Aug. 1, 1941, Lovie Whitaker) from about 1,700 to 4,500 ft. Rare summer resident in Brewster Co. from Alpine to the Rio Grande, where recorded from May 17 to Oct. 20. *Accidental*: Hidalgo Co., Bentsen–Rio Grande Valley State Park (1 male, June 23, 1962, H. P. Langridge).

HAUNTS AND HABITS: The Broad-billed Hummingbird is the dark hummer with vivid red bill which lives where desert mountains and rocky canyons touch the U.S.-Mexico border. Here it prefers sycamore and mesquite along streams or near springs; it also visits ocotillos, agaves, penstemons, and other blooming plants to feed on nectar and insects.

Flight of the Broadbill, especially as it flashes from

flower to flower, appears somewhat jerkier and more irregular than that of other hummers. Also, the species at times seems to be quieter and less active; individuals often perch on a dead twig in more or less open places, even on top of a tree, where they can survey their surroundings.

The chattering notes of the Broad-billed Hummingbird suggest those of a Ruby-crowned Kinglet. As with most hummers, calls are frequent when individuals are feeding and sparring on the wing; these activities continue all year.

DETAILED ACCOUNT: ONE SUBSPECIES

ARIZONA BROAD-BILLED HUMMINGBIRD, *Cynanthus latirostris magicus* (Mulsant and Verreaux)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Tail deeply emarginate; upper parts metallic light green, yellowish light green, or bronzy green, pileum duller, forehead sometimes dull grayish fuscous; tail metallic blackish indigo blue, four middle feathers broadly tipped with hair brown, others slightly margined with same; wing-quills fuscous with purple or blue sheen; wing-coverts above and below metallic green like back; chin and throat metallic paris blue, peacock blue, or greenish, laterally and posteriorly; remainder of lower parts metallic cossack green; lower tail-coverts dull white, some of feathers with drab central streaks or even metallic cossack green spots; tuft on each side of rump and on each side of anal region white. Bill carmine or purplish red, but basal two-thirds of maxilla sometimes reddish brown, terminal third of bill dark brown or black; iris dark brown; feet dull brown or black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but metallic feathers of lower parts (chin, throat, jugulum, breast, and abdomen) with narrow edgings and tips of hair brown or light hair brown. *Adult female, nuptial*: Acquired by wear from winter. Tail slightly double-rounded or slightly emarginate; upper parts similar to those of nuptial adult male but decidedly duller, pileum dull light buffy brown with slight greenish metallic sheen; middle pair of rectrices metallic green like upper parts, blackish at tips; basal half of other rectrices of same metallic green but with pale brownish gray tips and barred on outer feathers; lower parts dull grayish drab, sometimes lighter on chin and abdomen, sides of breast with some metallic green feathers; lower tail-coverts grayish white, darker grayish centrally; anal and rump tufts white; postocular spot white or grayish white; auricular region fuscous. Bill dark brown or brownish black, but basal portion of mandible dull red; iris dark brown; legs and feet dull brown. *Adult female, winter*: Acquired by complete postnuptial molt. Practically identical with nuptial adult female. *Male, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult male, but chin and throat more greenish (less bluish); remainder of metallic feathers of lower parts more yellowish (less bluish) green. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial male, but margins of feathers of upper parts duller—dull gray, buff, or ochraceous tawny; metallic feathers of lower parts with pale gray or dull buff margins. *Female, first nuptial*: Acquired by complete prenuptial molt. Similar to nuptial adult female, but upper parts rather duller; lower surface decidedly paler, particularly on chin, throat, and jugulum, and somewhat more buffy; chin and throat sometimes chamois yellow. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to first nuptial female, but feathers of upper surface margined or tipped with dull ochraceous tawny or pale gray. *Male, juvenal*: Acquired by postnatal growth. Similar to first winter male, but at first bill very much shorter; upper surface duller, feathers tipped or margined with pale grayish buff or ochraceous tawny; tail like that of adult male; chin and throat marked with a few metallic blue or green feathers, these margined terminally with

pale gray or buff, but sometimes metallic feathers entirely lacking. This plumage, as in most hummingbirds, is worn but a short time, most specimens showing transition to first winter with throat wholly or partly metallic. *Female, juvenal*: Acquired by postnatal growth. Similar to first winter female, but bill much shorter; upper surface duller, ochraceous edgings of feathers broader. Similar to nuptial adult female, but feathers of upper parts margined or tipped with buff, ochraceous tawny, or pale gray; lower surface more buffy, especially anteriorly; chin and throat sometimes chamois yellow. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 50.5–51.6 (average, 51.3) mm.; tail, 30.5–33.5 (31.8); bill (exposed culmen), 21.1–22.1 (21.6). *Adult female*: Wing, 49.5–51.1 (50.3); tail, 27.9–29.9 (28.7); bill, 20.6–23.4 (21.9).

RANGE: S. Arizona, s.w. New Mexico, and Trans-Pecos Texas, south to Nayarit. Winters from c. Sonora southward in Mexico.

TEXAS: *Breeding*: See species account.

NESTING: *Nest*: On mountains or slopes, in arroyos or canyons, often near water; built on low tree, bush, vine, or cactus, usually 4–7 ft. above ground; sometimes rather loosely constructed and saddled on branch; cup composed of shreds of bark, lichens, other plant fibers, vegetable down, bits of leaves, fine grass stems, milkweed seeds, and sometimes cotton, occasionally decorated on outside with narrow bits of plant stems, bits of leaves, and even white cotton thread or blooms of plants, rarely bits of lichens, whole bound together with cobwebs; lined with plant down and other fine materials, such as are on outer part of nest. *Eggs*: 2; elliptical oval; not glossy; pure white, without markings; average size, 12.2 × 8.1 mm.

Trogon: Trogonidae

COPPERY-TAILED TROGON, *Trogon ambiguus* Gould

SPECIES ACCOUNT

Merged into the Central American *Trogon elegans* by A.O.U. check-list, 1957 (see Appendix A). A short-billed, round-headed, gentle-eyed, soft-feathered bird of warm woodlands; perches (2 toes forward, 2 back) upright with long narrow tail hanging down. *Male*: yellow bill; iridescent bronzy green above (with coppery sheen on top of tail) and on forequarters; white crescent separates green chest from geranium red belly; black-tipped undertail otherwise white but crossed with fine blackish vermiculations. *Female*: iridescent parts of male replaced by brown pigment; a large white tear-mark back of eye; whitish breast; bright pink posterior under parts; undertail as in male, but transverse vermiculations often blacker and coarser. Length, 12½ in.; wingspan, 16¼.

RANGE: Border of s.e. Arizona and s.w. New Mexico, south through Mexico to Isthmus of Tehuantepec. Winters in Mexico.

TEXAS: *Casual*: Two individuals shot but not preserved, Starr Co., Rio Grande City and Las Cuevas (summer 1877; hunters described birds to J. C. Merrill who identified them as trogons; Merrill relayed reports to Robert Ridgway who pronounced birds "undoubtedly *T. ambiguus*, Gould"); bird observed carefully, Cameron Co., near San Benito (Sept. 23, 24, 1957, Terry Gill, L. C. Goldman, C. E. Hudson, Jr.); species said to occur at Brownsville (fide R. T. Peterson). Occasional vague reports of sightings in and near Big Bend Nat. Park, Brewster Co.

HAUNTS AND HABITS: Two species of the world's thirty-four trogons are especially famous: the Guatemalan Quetzal, most gorgeously plumed bird of the Americas, and *Trogon ambiguus*, only member of the family able to live wild in the United States. The Coppery-tailed Trogon is further remarkable among Trogonidae for its extraordinary ability to adapt to a wide variety of vegetation. In Arizona it lives in sycamore and walnut groves beside mountain streams (with or without water); in western Mexico it frequents everything from arid tropical scrub at sea level to pine-oak forests growing between 5,000 and 7,800 feet; in eastern Mexico it inhabits riverside Montezuma baldcy-

press (*Taxodium mucronatum*) and strangler figs (*Ficus*) as well as *Leucaena-Pithecellobium-Solanum* brush on foothills and lower mountain slopes. The species seems not to care what sort of woody plants it lives in, just so long as vegetation is fairly dry. This is an unusual reversal in view of the fact that most trogon species require either a dripping lowland rain forest or a misty mountain cloud forest. In its nesting habits, however, the present bird is typical. The female lays her eggs in a cavity within a dead tree trunk or tall stub. Since trogons prefer to enlarge the nest holes with their weak bills, they usually select very rotten trunks—so rickety, in fact, that many of them are toppled by winds.

Ordinary flight is slow with deep undulations similar to those of a woodpecker. In feeding, trogons display more dash. They dart out from a limb, hover momentarily before a fruit (often a tropical fig) or an insect on a leaf, quickly snatch the food, then gracefully fly back to the original or to a different perch tree.

In the spring and summer breeding season, Coppery-tailed Trogons call frequently during the day. Notes, sounding like a frog or hen turkey, have been described as *cory*, *cory*, *cory*, etc., or *co-ah*, *co-ah*, *co-ah*, etc. Ordinarily, notes are given leisurely, but at times the bird calls at twice the normal speed. When flushed at any time of the year it often utters a low, rapid clucking similar to that of other trogons.

DETAILED ACCOUNT: ONE SUBSPECIES

EASTERN COPPERY-TAILED TROGON, *Trogon ambiguus ambiguus* Gould

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Forehead and anterior part of crown black; occiput, sometimes crown, and remainder of upper surface, including anterior lesser wing-coverts and scapulars, bright bronzy green; rump and upper tail-coverts usually metallic dark green; middle pair of tail feathers bright coppery bronze with greenish or purplish sheen, broadly tipped with black or bluish black; two succeeding pairs also broadly tipped with black and greater part of outer webs like middle pair, their inner webs purplish black with metallic sheen; outer three pairs of feathers dull purplish black basally, outer webs except at base and broad terminal portions of inner webs white, freckled with purplish black over wide subterminal zone, this succeeded by a few very narrow bars of color of basal portion, but wide tips immaculate; wing-quills fuscous or hair brown, primaries narrowly margined with grayish white on outer webs, inner

primaries and secondaries with white area at base of inner webs; primary coverts unmarked; remainder of wing-coverts and outer webs of secondaries and tertials very finely vermiculated with dull grayish white; sides of head dull black or slate black; chin and upper throat dull slate black; jugulum color of back; breast with white crescent; lower breast, abdomen, and crissum geranium red; thighs slate black or blackish slate, longer feathers broadly tipped with pink or pinkish white; lining of wing hair brown, finely freckled with white. Bill yellow; bare eyelids red or orange; iris dark brown; feet dull brown. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by partial prenuptial molt. Forehead and anterior part of crown brownish slate, like chin and sides of head; remainder of upper surface between isabella color and raw umber; middle tail feathers rood brown or light vandyke brown, broadly tipped with black, next two feathers purplish clove brown, edged with color of middle feathers, except at tips, three outer feathers similar to those of adult male but more coarsely vermiculated, and outer webs with subterminal portions usually irregularly and narrowly barred with dull black; wing-quills between buffy brown and clove brown, outer feathers narrowly edged with white, and at base of inner webs with pale dull brownish white; secondaries edged on outer webs with pale buffy brown, exposed edges of wing-coverts like rump or very minutely freckled darker; tear-shaped mark behind eye brownish white; jugulum brown like back but rather lighter and with buffy white bar below posterior margin; broad bar across breast dull cinnamon buff; middle of abdomen dull white; lower sides, flanks, and crissum geranium red, feathers slightly edged with white; lining of wing buffy brown, mixed with buffy white and hair brown. Bill yellow, but duller than in nuptial adult male, maxilla sometimes tinged with brown. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, second winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to first winter male. *Male, first winter*: Acquired by partial postjuvenile molt. Similar to nuptial adult male, but throat duller, somewhat mixed with brownish slate; breast brown like that of adult female, sometimes mixed with red, and barred narrowly with white,

three outer tail feathers similar to those of first winter female, but somewhat more narrowly and numerously barred. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to first winter female. *Female, first winter*: Acquired by partial postjuvenile molt. Similar to nuptial adult female, but three outer tail feathers more broadly barred and scarcely or not at all vermiculated with black. *Male, juvenal*: Acquired by postnatal growth. Top of head brownish gray, tending to slate on forehead; back grayish brown with a few metallic bronzy green feathers; rump and upper tail-coverts dull cinnamon brown, more or less mixed with metallic green feathers; middle tail feathers dull brown with coppery sheen and narrowly tipped with brownish black; remainder of tail like first winter male; wings similar to those of adult female, but outer webs of tertials and inner secondaries paler with large buffy white spots at tips; greater coverts finely vermiculated with buffy white and with large buffy white spots at tips, remaining wing-coverts similar but with conspicuous terminal blackish edgings, these imparting squamate effect; chin and throat light fuscous with grayish tinge; remainder of lower parts dull white or buffy white, but sides shaded with light chaetura drab and middle of breast and abdomen broadly barred with same; lower tail-coverts dull white or buffy white, longer feathers with obscure mottlings of buffy brown and hair brown; lining of wing dull hair brown. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but upper and lower parts duller and lighter, without metallic feathers; tail less numerously and more broadly barred with purplish black, similar to that of first winter female.

MEASUREMENTS: *Adult male*: Wing, 123.0–135.6 (average, 128.0) mm.; tail, 154.9–175.5 (165.1); bill (exposed culmen), 16.5–19.0 (18.3); tarsus, 14.5–15.5 (15.0); middle (inner anterior) toe without claw, 14.0–16.5 (14.7). *Adult female*: Wing, 123.0–134.1 (129.0); tail, 168.4–183.9 (175.8); bill, 16.5–18.0 (17.3); tarsus, 14.5–15.5 (15.2); middle (inner anterior) toe, 14.0–15.5 (14.7).

RANGE: Durango to n. Nuevo León and Tamaulipas, south to Nayarit, Guerrero, and Veracruz; casual in extreme s. Texas (probably this race). In winter largely withdraws from n. Nuevo León and n. Tamaulipas.

TEXAS: *Casual*: See species account.

Kingfishers: Halcyonidae

BELTED KINGFISHER, *Megaceryle alcyon* (Linnaeus)

SPECIES ACCOUNT

Ceryle alcyon of various authors. A stocky, bull-headed, bushy-crested bird with long heavy bill, very short legs, and weak feet; dives headlong for fish. *Male*: blue-gray above with white neck-collar; largely white below with blue-gray band across upper breast. *Female*: like male, but with rusty flanks extending in band across lower breast. Length, 13¼ in.; wingspan, 22¼; weight, 4½ oz.

RANGE: Tree-limit in North America from n.w. Alaska to c. Labrador and Newfoundland, south to s. United States. Winters from s.w. Canada and n. United States to n. South America; also West Indies.

TEXAS: (See map.) *Breeding*: Late Mar. or early Apr. to mid-July (eggs, Apr. 15 to June 19) from near sea level to 4,500 ft. Locally fairly common to scarce in most of northeastern three-quarters southwest to Pecos, southwestern Edwards Plateau, San Antonio, and upper coast, but largely absent from arid middle and southern Panhandle. *Winter*: Early Aug. to early May (extremes: July 22, June 20). Fairly common to uncommon in most of state; fairly common transient through southern Trans-Pecos, but scarce in winter.

HAUNTS AND HABITS: Among the world's eighty-seven species of kingfishers, only the Belted is widespread in temperate North America. Throughout the United States its high rattle announces lakes, rivers, and streams where fishing is good. A conspicuous figure on Texas waterways, it is generally observed performing its expert fishing maneuvers or perching in classic kingfisher fashion on a low branch overhanging the water. Because the Belted requires clear water for its feeding operations, it avoids muddy, vegetation-choked, or dirty streams, rivers, or ponds. This solitary bird is seldom seen except singly, in pairs, or occasionally in family groups when adults apparently are instructing the young. Individuals vigorously guard their fishing territories from intruding members of the species.

Flight of the Belted is swift, strong, and graceful. Generally the bird flies fast and low over the water's surface, moving on several wing-beats followed by a smooth glide on half-closed wings. The bird hunts from an overhanging perch or as it hovers above the

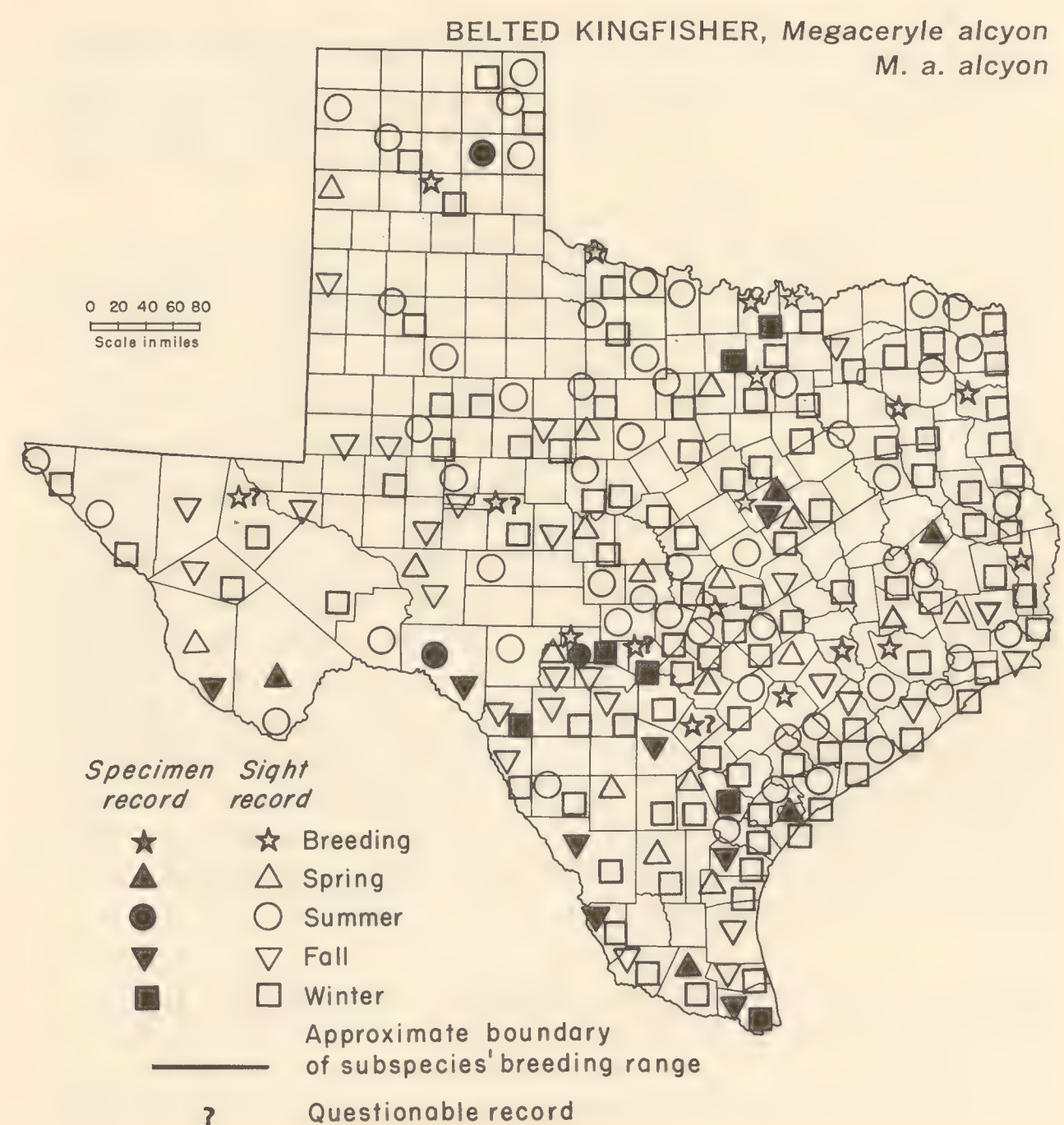
surface of the water; when prey is spied it plunges swiftly to secure it in its beak. The favored food is small fish six inches or less in length. When fish are scarce, kingfishers eat crabs, crayfish, mussels, lizards, salamanders, various insects, and even berries. Indigestible portions of its diet—bones, fish scales, shells, seeds, etc.—are disgorged in pellet form.

The call of the Belted Kingfisher is a loud, high, unmusical rattle difficult to describe in syllables but easily recognized in the bird's favored habitat. Rattling goes on all year.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN BELTED KINGFISHER, *Megaceryle alcyon alcyon* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts rather light slate color; hind-neck, with chin and throat, white, forming collar around neck; long feathers of crest with darker shafts; tail dull chaetura black, middle pair of feathers and outer margins of all but outermost pair more or less broadly slate color, all but middle feathers narrowly and brokenly barred with white; wing-quills fuscous



or chaetura drab, primaries with large white spot on middle of inner webs, extending nearly to base of feathers; outer webs with a few white spots on middle portions, secondaries and inner primaries narrowly tipped with white; secondaries broadly margined on outer webs with slate of back and broadly barred on inner webs except at tips with white, a few minute spots of white on slate-colored portions of outer webs of secondaries and tertials; outer wing-coverts like back with a few minute spots of white; lores dull black or chaetura black with a small white spot on each lore; small white spot on lower eyelid; sides of head and posterior part of neck slate color like back, merging into broad band of same color across jugulum which separates white collar from white of posterior lower parts; sides more or less tinged with slate gray; lining of wing white; slightly mixed with slate gray posteriorly. Bill black, base slate color and clouded with light gray; iris dark vandyke brown; feet and legs brownish black; claws black. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Similar to adult male, but sides and an additional broad band, sometimes interrupted, across lower breast cinnamon rufous, more or less tinged with brown; this breast-band separated from blue one with a band of white; lining of wing including axillars slate color. Bill black, but base of mandible lighter; iris dark brown; legs and feet slate gray or dull brown. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding sex of adults in winter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male. *Male, first winter*: Acquired by wear from juvenal male, with which it is practically identical. *Female, first nuptial*: Acquired by partial prenuptial molt. Very similar to nuptial adult female. *Female, first winter*: Acquired by wear from juvenal female, with which it is practically identical. *Male, juvenal*: Acquired by postnatal growth. Similar to adult male, but slate color of jugular band more or less mixed with cinnamon brown. Bill dark slate color, but base and narrow tip greenish white; iris dark brown; legs and feet dull yellow; toes dark slate color. *Female, juvenal*: Acquired by postnatal growth. Like adult female, but slate-colored band across jugulum more or less extensively mixed with cinnamon or cinnamon brown. Bill dark slate color, but base greenish slate color; legs greenish white; toes brown, but soles salmon color. *Natal*: None. Bird hatched unfeathered; skin dull white.

MEASUREMENTS: *Adult male*: Wing, 145.0–161.0 (average, 156.2) mm.; tail, 82.0–93.5 (87.6); bill (exposed culmen), 53.1–61.5 (54.6); tarsus, 10.9–11.9 (11.4); middle toe without claw, 14.5–17.0 (15.7). *Adult female*: Wing, 150.1–165.1 (158.8); tail, 81.0–96.0 (88.6); bill, 54.6–63.0 (58.7); tarsus, 9.9–11.9 (10.9); middle toe, 14.5–16.0 (15.7).

RANGE: W. Yukon and n. Manitoba to Labrador, south to s. Texas and e. Florida. Winters from s.w. Idaho and Massachusetts through e. Mexico and Central America to n. Venezuela; also West Indies and Trinidad.

TEXAS: *Breeding*: Collected north to Gray, east to Trinity, southwest to Kerr and Val Verde cos. *Winter*: Taken north to Cooke, east to Trinity (Mar. 20), south to Cameron, west to Presidio (Sept. 1) cos. Fairly common.

NESTING: *Nest*: In forests or open land, often cultivated areas, mostly along streams or about other bodies of water, but also in railroad or other cuts; even in hollow of tree or stub; if in burrow in a bank, usually 3–6 ft. (sometimes up to 15 ft.) deep in sandy clay or other earth; diameter of burrow 3–4 in.; eggs laid in an enlargement at end of burrow on fish scales and bones, sometimes leaves, grasses, twigs, crayfish shells, and wing-shields of beetles. *Eggs*: 4–14, usually 6 or 7; short ovate to rounded ovate or nearly spherical; smooth and somewhat glossy; white, unmarked; average size, 34.0 × 26.7 mm.

WESTERN BELTED KINGFISHER, *Megaceryle alcyon caurina* (Grinnell)

DESCRIPTION: *Adult male and female, nuptial plumage*: Simi-

lar to *M. a. alcyon* but decidedly larger, particularly wing, tail, and bill, and wing tip relatively longer.

MEASUREMENTS: *Adult male*: Wing, 159.0–168.9 (average, 163.3) mm.; tail, 87.9–96.5 (92.2); bill (exposed culmen), 55.1–64.0 (59.2); tarsus, 10.9–12.4 (11.4); middle toe without claw, 14.0–16.0 (15.2). *Adult female*: Wing, 159.0–169.4 (165.6); tail, 87.9–101.1 (93.2); bill, 53.1–71.1 (59.7); tarsus, 10.4–11.9 (11.4); middle toe, 15.5–17.0 (16.3).

RANGE: N.w. Alaska, south to s. California and Utah. Winters from s. British Columbia and n.w. Idaho to s. Baja California and Chihuahua; casually to c. Texas.

TEXAS: *Winter*: One specimen: Kendall Co., Boerne (Feb. 21, 1880, N. C. Brown).

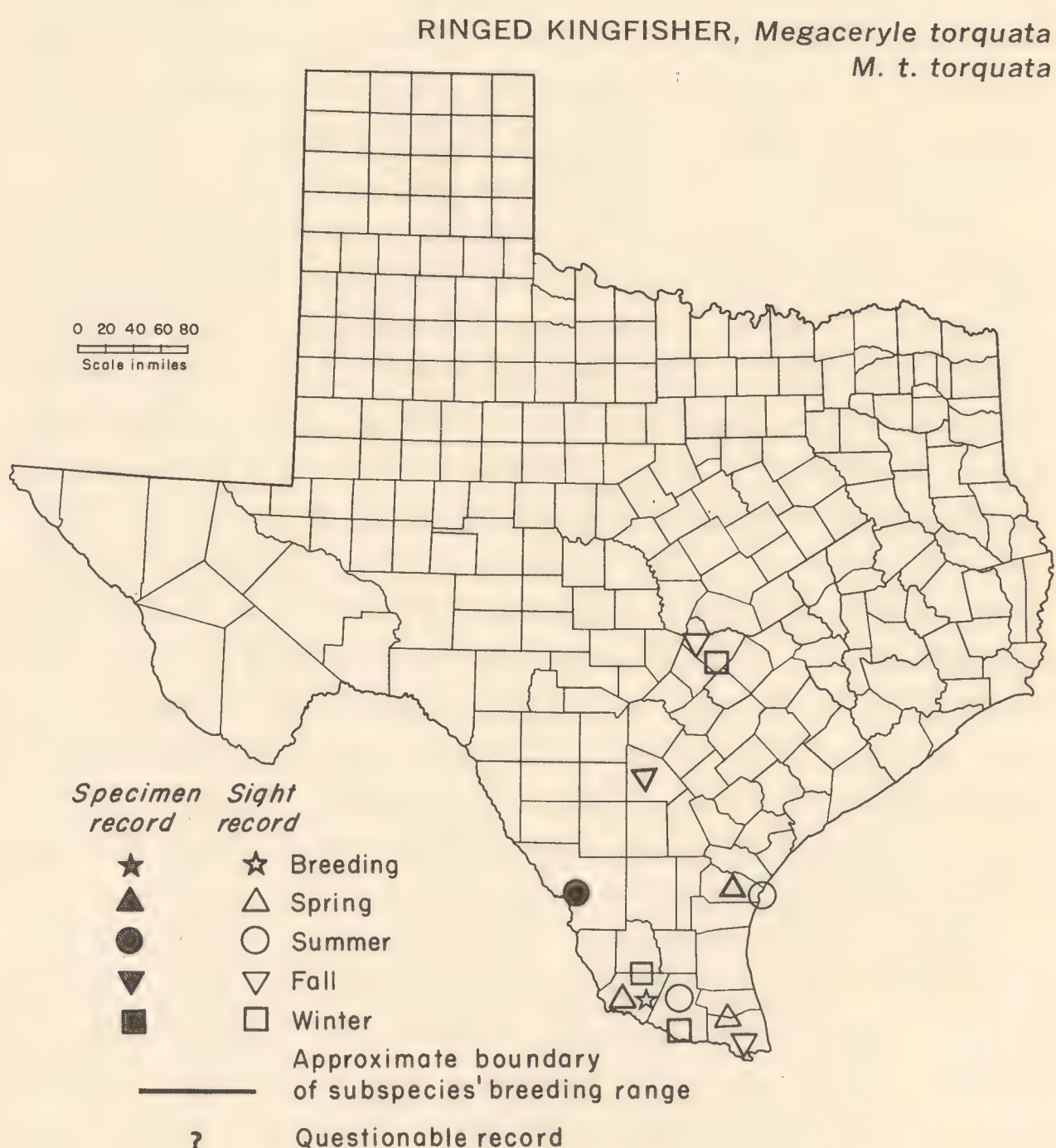
RINGED KINGFISHER, *Megaceryle torquata* (Linnaeus)

SPECIES ACCOUNT

Also known as Great Rufous-bellied Kingfisher. *Ceryle torquata* of various authors. Suggests an overgrown Belted—twice its size in bulk with massive head and bill; coloration of upper parts similar. *Male*: rufous breast, belly; mostly white crissum. *Female*: broad blue breast-band separated by narrow white crescent from rufous lower breast, belly, and crissum. Length, 16½ in.; weight, 10¼ oz.

RANGE: Sinaloa and southernmost Texas, south, chiefly in lowlands, through Mexico (including Tres Marias Islands), Central America, and South America (including Isla Margarita, Trinidad) to Tierra del Fuego; also Lesser Antilles.

TEXAS: (See map.) *Resident*: Recently found nesting on Texas side of Rio Grande: Starr Co., 2 mi. below Falcon Dam, at head of small arroyo about 200 ft. from river (parents carrying fish into burrow, Apr. 8, 1970,



A. D. McGrew; for details, see *Auk* 88 [1971]: 665–666). Uncommon along lower Rio Grande between Falcon Dam and mid-Hidalgo Co.; scarce downriver (breeding doubtful) to mouth; perhaps rare visitor some miles inland (e.g., Edinburg, Aug. 11, 1971, J. C. Arvin). One specimen taken at Laredo in 1888 (see detailed account), but current status upriver from Falcon Reservoir unknown. Casual in Nueces Co., Hazel Bazemore Park (Mar. 7, 1969, G. W. Blacklock, Kay McCracken, Emilie Payne; Aug. 3, 1972, Blacklock, et al.). Accidental in Atascosa Co., Pleasanton (Nov. 6, 1971, B. Bensmiller, Jean Bensmiller, Ruth Pullin); Travis Co., Austin, Barton Springs (Nov. 15–Dec. 11, 1955, Frances Gillotti, E. B. Kincaid, Jr., Emma Leta Purcell, Eugene Tinnan, F. S. Webster, Jr., et al.).

HAUNTS AND HABITS: The Ringed Kingfisher, mightiest kingfisher of the Americas, is a giant from the Neotropics. Texas is indeed fortunate to have so spectacular a visitor—one which in late years (1960’s into 1970’s) seems to be settling down a bit.

As befits its size, this species usually fishes, singly or in pairs, along large bodies of water, such as sizable lakes and big rivers; the lower Rio Grande is, in fact, its chief Texas home. Typically, *M. torquata* is seen on a more or less bare limb, commonly willow, overhanging the slowly moving current. It often perches near its kingfisher relatives, but usually somewhat higher than the Belted and much above the Green. When a suitable fish or frog swims near, the kingfisher drops off its perch, plops into the water with a loud splash, and grabs its prey between its powerful mandibles. This bird also occasionally hovers in the air, then dives headlong to seize its prey, but it appears to forage in this manner less than does the Belted Kingfisher. Captured food is flown to a bare limb, usually beaten against the branch several times, then swallowed head-first.

Rattles—better described as clatters—of the Ringed Kingfisher are much lower pitched and heavier than those of the Belted. A loud *kleck kleck kleck kleck* has been described by A. F. Skutch, and a rusty *cla-ack*, etc., by F. S. Webster, Jr. The bird vocalizes on the wing and from its perch the year round.

CHANGES: The Ringed Kingfisher appears to be slowly increasing in Texas, the only U.S. state where it has been found. From June 2, 1888, when G. B. Benners collected the first north-of-the-border specimen at Laredo, until 1950, the species was regarded by ornithologists as a mere accidental. In the 1950’s, careful sight records were established at Brownsville and San Benito in Cameron County and even at Austin in Travis County. By 1960, Roger Tory Peterson stated in *A Field Guide to the Birds of Texas* that there were “at least seven records”; this would seem to up the bird’s status to casual.

Since at least March 2, 1966, when E. B. Kincaid, Jr., and J. L. Rowlett found a male at Fronton, the Ringed Kingfisher has been seen repeatedly along the Rio Grande in Starr and Hidalgo counties. At least one pair has been present during the summer since 1967, and in

1970, breeding in the state was confirmed. At Falcon Dam, only place in the United States where the Ringed Kingfisher occurs regularly, Audubon Christmas bird counters have found the species in increasing numbers every winter since 1967:

Christmas Season	Ringed Kingfishers
1967	1
1968	1
1969	3
1970	2
1971	5
1972	11

Why is the Ringed Kingfisher expanding its range a bit when practically all other fish-eating birds are declining? It is noteworthy that the Texas Ringed Kingfishers reside along the Rio Grande from Falcon Dam (completed in 1953) to mid-Hidalgo County. Apparently the dam has sufficiently held back silt, detergents, and other pollutants from upriver, thereby allowing kingfishers to see their prey in relatively clear, pure water. Also, water going over the spillway picks up oxygen, thus aiding aquatic life downstream. In addition, the river banks in Starr County are high enough for kingfisher nest holes. Ringed Kingfishers are most numerous on the Rio Grande for a stretch of about fifteen miles from the dam to Roma where water is cleanest and there are few settlements. Farther downstream, *M. torquata* numbers thin out as the progressively polluted river courses through a succession of communities and agricultural land saturated with chemicals.

Perhaps the Marte Gomez Reservoir (Azucar), located a few miles south in Tamaulipas and completed prior to Falcon Dam, aided the species’ northward range extension.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN RINGED KINGFISHER, *Megaceryle torquata torquata* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper surface bluish slate gray, feathers of occiput and short crest with rather broad shaft streaks of fuscous; white collar on hindneck; a few of longest upper tail-coverts narrowly barred or spotted with white; tail chaetura black edged on outer webs more or less broadly with color of back and numerous barred irregularly with white, these bars narrowest on middle feathers; tip also white; wing-quills dull black, primaries with large spots or bars of white on inner webs, secondaries barred with white on inner webs, secondaries and most of primaries narrowly tipped with white, and innermost secondaries with small spots of white on outer webs and edged with color of back; wing-coverts and scapulars like back, some feathers with dark shafts; primary coverts like primaries but with very narrow slate gray edgings; lores fuscous black; round supra-loral spot and another small one on lower eyelid white; sides of head like back; chin, throat, and collar on sides of neck connecting with that on hindneck white; crissum white; flanks slate gray barred or spotted with white; remainder of lower parts tawny or deep cinnamon rufous; lining of wing white; axillars white with a few spots of hair brown. Bill dull black or brownish black, greenish white basally; iris dark brown; legs and feet olive green or light olive green, but soles of toes yellow; claws black. *Adult male, winter:* Acquired by complete postnuptial

molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but crissum and lining of wing cinnamon rufous; jugulum bluish slate gray; breast with band of white. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding sex of adult in winter. *Male, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult male but rather duller. *Male, first winter*: Acquired by wear from juvenal, with which it is practically identical. *Female, first nuptial*: Acquired by partial prenuptial molt. Similar to nuptial adult female but rather duller. *Female, first winter*: Acquired by wear from juvenal, with which it is practically identical. *Male, juvenal*: Acquired by postnatal growth. Similar to adult female, but blackish streaks on pileum broader and more numerous; wing-coverts, often back and scapulars, dotted with white and with shaft streaks of chaetura drab; lower parts paler throughout; jugulum more or less mixed with dull cinnamon; lining of wing largely white; white pectoral band washed with cinnamon. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but lining of wing wholly cinnamon rufous; pectoral band more distinct, less washed with cinnamon; jugulum usually brighter and more uniform tawny. *Natal*: None. Bird hatched unfeathered; skin white (pink in life).

MEASUREMENTS: *Adult male*: Wing, 184.9–211.1 (average, 196.3) mm.; tail, 110.0–129.0 (120.9); bill (exposed culmen), 74.9–94.0 (84.3); tarsus, 14.5–17.0 (15.2); middle toe without claw, 19.6–23.6 (21.4). *Adult female*: Wing, 185.0–210.1 (197.9); tail, 111.5–132.1 (121.2); bill, 75.9–90.9 (82.8); tarsus, 14.0–16.5 (15.2); middle toe, 19.6–23.6 (21.9).

RANGE: C. Sinaloa and extreme s. Texas, south through lowlands of Mexico and Central America to c. Argentina.

TEXAS: *Resident*: One specimen: Webb Co., Rio Grande 1 mi. south of Laredo (June 2, 1888, G. B. Benners). (See species account.)

NESTING: *Nest*: In high banks of rivers or canals, but occasionally a long distance from water, usually in brushy or forested regions; sometimes in small colonies; tunnel in the bank, 6 in. in diameter and usually 7–9 ft. long, rising then descending, with an enlarged chamber at end; eggs laid on fish bones and scales. *Eggs*: 2–6, usually 4–5; ovate to oval or short ovate; glossy; white, unmarked; average size, 43.7 × 34.5 mm.

GREEN KINGFISHER, *Chloroceryle americana* (Gmelin)

SPECIES ACCOUNT

Texas Kingfisher and Little Green Kingfisher of various authors. A small, relatively uncrested kingfisher, dark green above with numerous white wing-spots forming bars; has white collar (around hindneck); under parts with dark green side-spots; outer tail feathers spotted and streaked with white. *Male*: broad rusty breast-band. *Female*: dark green spots on breast more or less coalesce to form two irregular bands. Length, 8¾ in.; wingspan, 12¼.

RANGE: N. Sonora (casually s. Arizona) and s.w. Texas, south through Mexico and Central America to w. Peru, Argentina, and Uruguay.

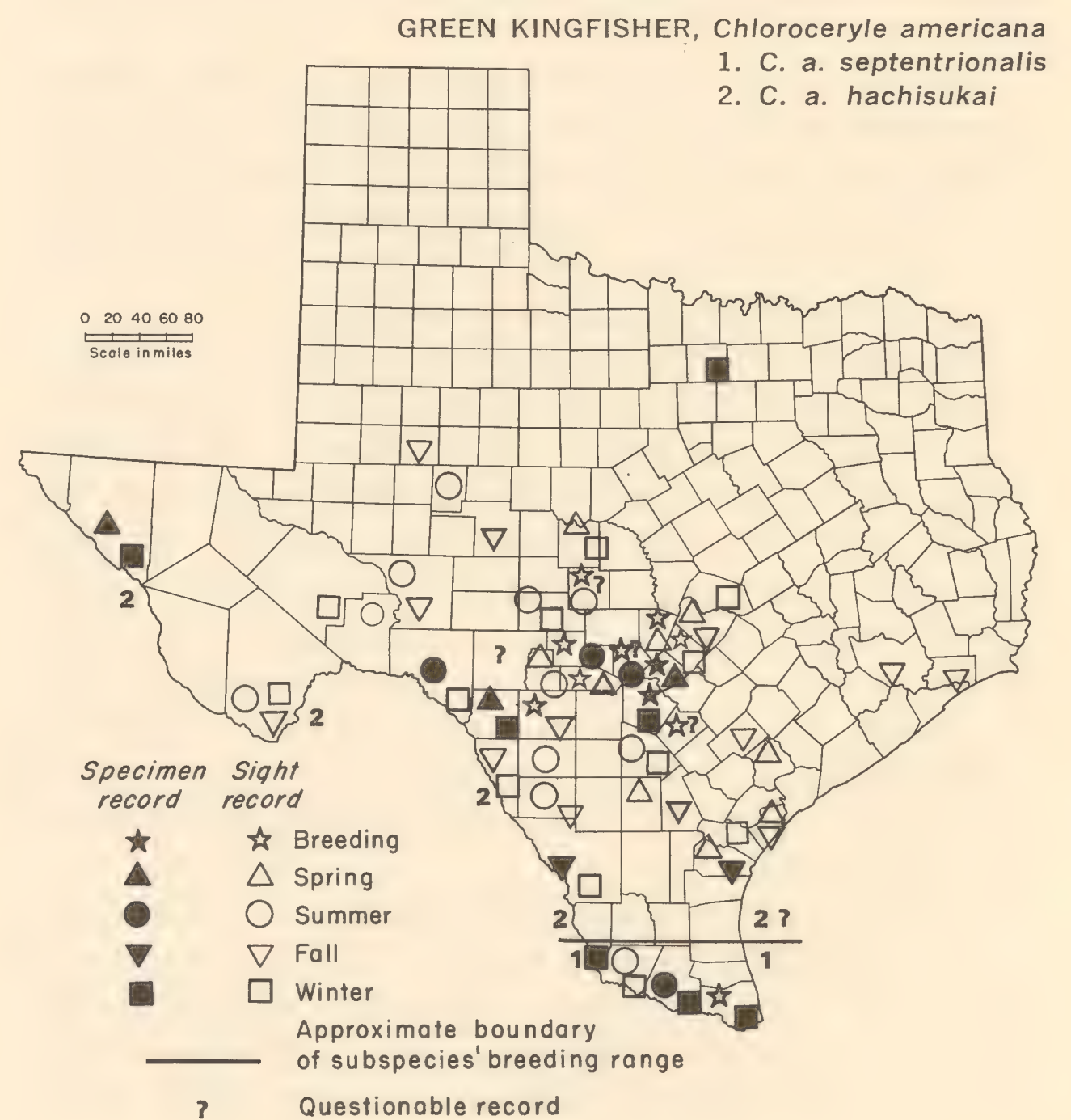
TEXAS: (See map.) *Resident*: Breeds, late Feb. to late June (eggs, Mar. 4 to May 29) from near sea level to 2,000 ft. Fairly common to uncommon from southern Pecos River east locally across southwestern Edwards Plateau (chiefly Devils, Nueces, Frio, Sabinal, and Medina rivers) to Bandera Co., and south locally along rivers to Starr Co. (breeding suspected along Rio

Grande); scarce to rare on central and southeastern Plateau (chiefly Guadalupe, Pedernales, and Blanco rivers). Formerly bred north on Plateau to Mason Co. (Llano River), southeast to Bexar Co. (San Antonio River), and in Rio Grande delta. *Vagrant*: Rare visitor upriver to Big Bend Nat. Park (formerly to Hudspeth Co.) and east to Austin vicinity. Casual north to Tom Green Co. (Oct. 3, 1970, Randy Harkey), Sterling Co. (Aug. 27, 1928, W. W. Bowen), and Howard Co. (Sept. 28, 1928, Bowen), also south along Guadalupe River (De Witt Co., Sept. 6, 1905, A. H. Howell; Victoria Co., Apr. 16, 17, 1928, A. J. Kirn) and on central coast (see detailed account) and upper coast (Houston, Nov. 6, 1916, R. A. Selle; Cove, Oct. 9, 1935, A. K. McKay). Accidental in Wise Co. (see detailed account).

HAUNTS AND HABITS: The trim Green Kingfisher is the middle-sized of the three green-backed kingfishers which live in tropical Mexico; of the trio, it alone crosses the Rio Grande. In Texas its favored retreats—in addition to the Rio Grande—are clear rivers and streams on the Edwards Plateau; nowadays the Devils River is especially favored. Typical of its family, it is a solitary species, although occasionally it is seen in pairs.

In flight and behavior the Green resembles a miniature Belted Kingfisher. Like its larger relative, it is usually seen either perched on a snag or branch overhanging water or darting low over the water, *ticking* as it flies. When fishing, the Green does not hover as much as does the Belted Kingfisher, but instead does most sighting of prey from a low perch—usually less than six feet above the water's surface. Favored food is small fish.

The Green Kingfisher's wee but sharp *tick, tick, tick*



is like the sound made when two hard pebbles are struck together. A squeaky *cheep* is generally uttered on the wing. Vocalizations are heard throughout the year.

CHANGES: The Green, like other kingfishers, requires reasonably clear water in order to see its prey. Also it cannot tolerate pesticides that concentrate in aquatic life. In addition, water backed up by dams inundates nesting banks. About the big, dirty, muchly dammed cities of Austin and San Antonio, this kingfisher has disappeared, except for wandering individuals, since World War II. During the same period, the species declined drastically in the heavily farmed areas of the Rio Grande delta; pollution and the disturbances of civilization are probably to blame here too. However, the delta was apparently always more of a fishing than a nesting grounds for this bird. Delta land is so flat that it offers few banks suitable for kingfisher nests.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN GREEN KINGFISHER, *Chloroceryle americana septentrionalis* (Sharpe)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by partial prenuptial molt. Upper parts, including wing-coverts, metallic dark green, becoming duller on head and fuscous on forehead, the latter with minute white dots; broad white collar on hindneck; scapulars spotted with white; tail dull metallic bluish green, narrowly tipped with white, next to middle pair of feathers with large spots of white on inner webs and basally on outer webs, the remaining tail feathers basally white for most of their length; wing-quills fuscous, outer webs of secondaries green like back, primaries with white spots on middle portions, and secondaries with white spots on all outer webs, inner webs of both primaries and secondaries with a few spots or bars of white; wing-coverts with a few small dots of white; lores fuscous black; narrow supraloral streak of dull whitish, mixed with fuscous; chin, throat, and sides of neck meeting collar on hindneck white; broad band on jugulum dark cinnamon rufous or bright tawny; remainder of lower surface white; sides of breast and of body with large spots of metallic green like back; crissum with a few spots of same; lining of wing pale buff or buffy white, with a few fuscous markings. Bill black or dull black, with tinge of orange-brown at angle of gonys, usually paler at tip and on basal portion of gonys; iris dark brown; legs and feet dull black, slate black, or blackish brown. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adult male, but without any tawny or chestnut rufous on breast, instead metallic green spots more or less coalesce to form two irregular bands across breast; white of lower surface more tinged with buff, especially on anterior portions. *Adult female, winter:* Acquired by com-

plete postnuptial molt. Similar to nuptial adult female. *Male, second winter:* Acquired by complete postnuptial molt. Like adult male in winter. *Male, first nuptial:* Acquired by wear from first winter. Similar to nuptial adult male. *Male, first winter:* Acquired by complete postjuvenile molt. Same as first nuptial male. *Female, first nuptial:* Acquired by wear from first winter. Practically identical with nuptial adult female. *Female, first winter:* Acquired by complete postjuvenile molt. Like first nuptial female. *Male, juvenal:* Acquired by postnatal growth. Similar to nuptial adult female, but jugular band more or less mixed with or replaced by tawny or deep cinnamon rufous. Bill dark brown, mandible much streaked with yellowish flesh color; iris dark brown; legs and feet dark brown. *Female, juvenal:* Acquired by postnatal growth. Similar to nuptial adult female, but upper parts rather duller, jugular band duller, less metallic, more brownish, this band formed by broad streaks rather than spots and tinged with buffy or cinnamon. *Natal:* None. Bird hatched unfeathered; skin white.

MEASUREMENTS: *Adult male:* Wing, 80.0–87.9 (average, 83.8) mm.; tail, 56.4–61.5 (58.2); bill (exposed culmen), 43.4–50.5 (47.3); tarsus, 8.9–9.9 (9.7); middle toe without claw, 10.9–12.4 (11.7). *Adult female:* Wing, 82.0–89.9 (86.1); tail, 55.6–62.0 (58.9); bill, 43.9–50.0 (47.3); tarsus, 8.9–10.4 (9.7); middle toe, 11.4–13.0 (12.2).

RANGE: Extreme s. Texas and Tamaulipas, south to Colima, Oaxaca, and s. Guatemala.

TEXAS: *Resident* (at least formerly): Collected in Hidalgo and Cameron cos. Uncommon and local.

NESTING: Similar to that of *C. a. hachisukai* (see below).

WESTERN GREEN KINGFISHER, *Chloroceryle americana hachisukai* (Laubmann)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. a. septentrionalis*, but white markings on upper surface larger; forehead more extensively streaked with white; all wing-coverts normally spotted with white; green of upper surface more yellowish or brassy (less bluish).

MEASUREMENTS: *Adult male:* Wing, 81.0–85.6 (average, 83.8) mm.; tail, 56.9–61.5 (58.9); bill (exposed culmen), 42.9–49.0 (46.8); tarsus, 8.9–9.9 (9.1); middle toe without claw, 11.4–12.4 (11.7). *Adult female:* Wing, 83.6–87.9 (85.9); tail, 58.4–61.0 (59.7); bill, 40.9–48.0 (45.2); tarsus, 8.9–9.9 (9.7); middle toe, 10.9–13.0 (12.2).

RANGE: N. Sonora and c. Texas, south to Jalisco and San Luis Potosí.

TEXAS: *Resident:* Collected in Val Verde, Kinney, Kerr, Kendall, Bexar, Comal, and Webb (breeding questionable) cos. Locally fairly common. *Vagrant:* Collected in Wise, Nueces, and Hudspeth cos.

NESTING: *Nest:* In woodlands, open country, hills or lowlands, along streams or sloughs; in tunnel, 2–2¼ in. in diameter and 2 ft. long, made by the bird in earth bank, the entrance often concealed by hanging vines or exposed roots; eggs laid in enlarged inner end of burrow on bare ground of fish bones and scales. *Eggs:* 3–6, usually 5; oval to elliptical oval; smooth, sometimes glossy; white or cream white; unmarked; average size, 24.4 × 18.5 mm.

Woodpeckers: Dryocopidae

YELLOW-SHAFTED FLICKER, *Colaptes auratus* (Linnaeus)

SPECIES ACCOUNT

See colorplate 14

A rather large woodpecker with chisellike bill; extremely long, sticky, somewhat barb-tipped tongue; powerful neck muscles and feet (2 toes forward, 2 back); strong, stiff tail. Gray cap with small red crescent on nape; brownish face and throat (male has black "mustache"); black-barred brown above with white rump (spotted with black in Cuban race); buffy below with black crescent on breast and numerous rounded black spots; has yellow wing- and tail-linings. Length, 12¼ in.; wingspan, 19¾; weight, 5 oz.

RANGE: Tree-limit in North America from c. Alaska to Newfoundland, south to c. British Columbia and east of Rockies to s.e. Texas, Gulf coast, and s. Florida; also Cuba, Grand Cayman. Northern races migratory, wintering chiefly in eastern two-thirds of United States; may remain north in small numbers irregularly well into Canada and a few reach south into California, Arizona, and extreme n.e. Mexico.

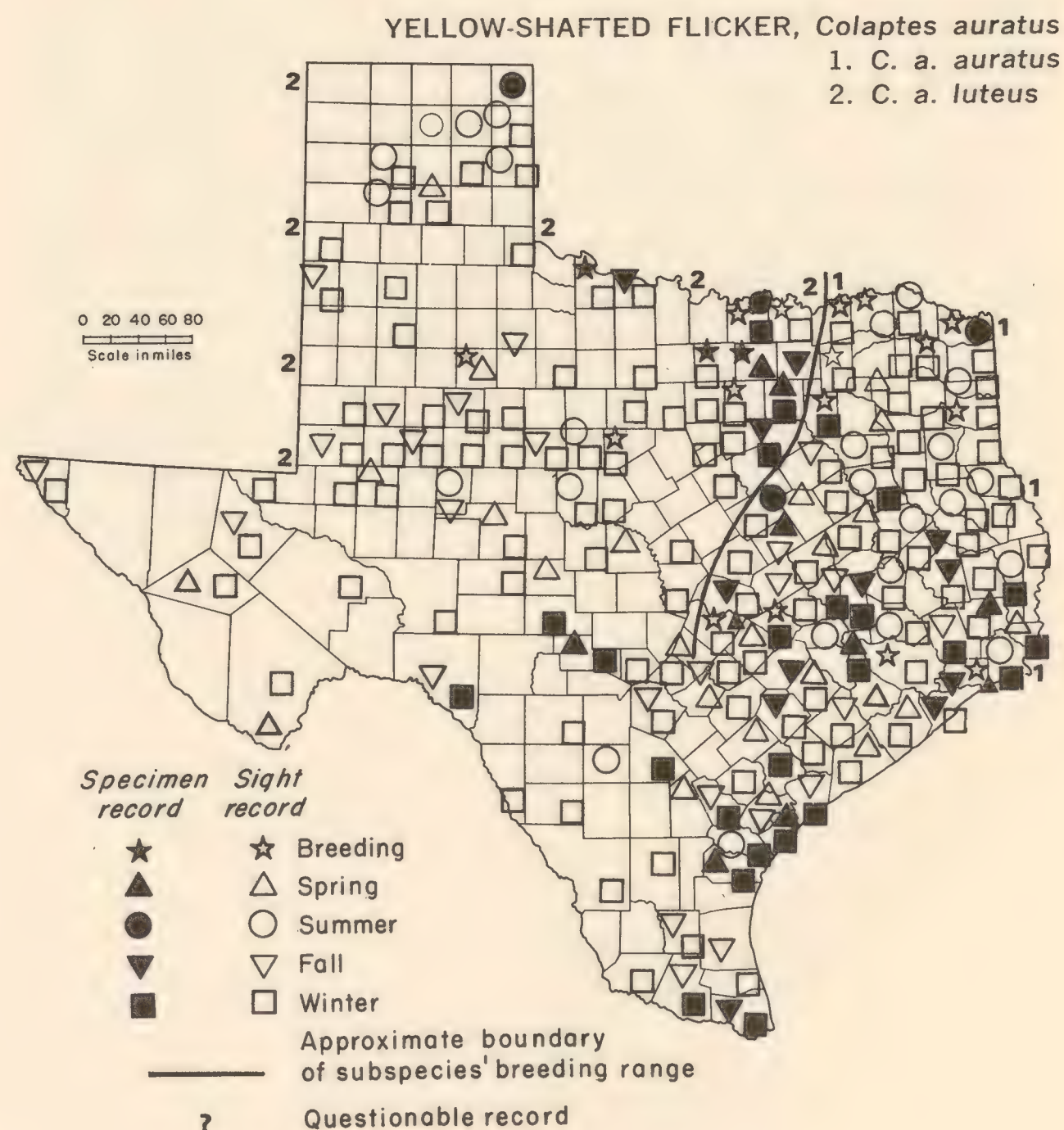
TEXAS: (See map.) *Breeding:* Early Apr. to late July (eggs, Apr. 15 to July 10) from near sea level to 3,700 ft. Uncommon and irregular in northeastern Panhandle, east locally along Oklahoma border to northeastern corner of state; scarce in remainder of eastern quarter south to Harris and Chambers cos. Formerly bred over much of northeastern half west to Potter, Kent, Eastland, and Travis cos. *Winter:* Late Sept. or early Oct. to early Apr.—a few to late Apr. (extremes: Aug. 20, June 2). Common to fairly common through most of eastern three-quarters; uncommon in northwestern Panhandle and eastern Trans-Pecos; scarce in Rio Grande delta; scarce to rare in western Trans-Pecos.

HAUNTS AND HABITS: Flickers constitute a distinct group among the world's 210 species of woodpeckers. They have colorful wing- and tail-linings and they are more prone to peck on the ground with their bills for insects. Indeed, the South American Campos Flicker, *Colaptes campestris*, regularly excavates its nest hole in a clay bank, only rarely in a tree trunk.

The Yellow-shafted Flicker of North America frequents open coniferous and mixed forests and their margins as well as the clearings which are so common

in east Texas woodlands. It lives also about farms and orchards in rural areas and on lawns and in gardens and parks of towns and cities. In spring and summer it is seen generally singly or in pairs; however, during migration and often in winter, scattered noisy companies are conspicuous in more open woods and grassy meadows.

Ordinary flight of the Yellowshaft is powerful, undulating, and seldom protracted; prolonged migration flight is steadier, more direct, and swift. Daily movement consists chiefly of passage between trees or to the ground as the bird pursues ants, beetles, crickets, caterpillars, spiders, snails, and a variety of wild fruits. More terrestrial than most other woodpeckers, it forages with ease on the ground; often it takes up its post at the entrance of an anthill and quickly laps up ants with its sticky tongue. Especially in winter, this flicker seeks night roosting in any available cavity of a tree or decayed stump or it excavates its own hole; often it sleeps under eaves or on rafters of barns or other out-buildings. Although it clings to trunks and limbs in



the characteristic woodpecker fashion, it frequently perches crosswise on a limb passerine style.

Yellowshaft vocalizations and descriptions of them are varied and numerous. In spring the most frequently heard call is a loud, far-reaching *wick wick wick wick wick*, etc. Variations of this are series of *wake-up's*, *wicker's*, *yucker's*, *flicker's*, or *flick-a's*. A note heard chiefly in late summer, fall, and winter is a loud, ringing *klee-yer*. Springtime drumming is a very rapid roll tapped on a hollow log or stump, or often on a tin roof or garbage can. Like the songs of passerine birds, drumming in this and other woodpeckers appears to function chiefly in proclamation of territory. (Note: In the following woodpecker write-ups, springtime drumming is mentioned mainly when it is an aid to identification of the species.)

CHANGES: Like many other birds which require considerable coolness and humidity for breeding, the Yellow-shafted Flicker is retreating northward as a nester. In fact, it—like the Baltimore Oriole with which it used to share its Texas habitat—is almost out of the reproduction business in the state. From the 1890's to 1957, the climate in Texas gradually became warmer and drier; this is probably the major factor which has nudged this flicker north. Also, massive poisoning, especially since the 1950's, of ants and other favorite flicker foods probably has had a depressing effect.

DETAILED ACCOUNT: THREE SUBSPECIES

SOUTHERN YELLOW-SHAFTED FLICKER, *Colaptes auratus auratus* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Pileum, hindneck, and most of sides of neck brownish neutral gray; broad nuchal crescent scarlet; back, scapulars, wing-coverts, and secondaries drab to olive drab, with bars of black that are narrower than interspaces; rump and upper tail-coverts white, the latter with spots of black, longest upper tail-coverts black with yellow shafts and numerous barred with white; tail dull black, basal portions of feathers somewhat brownish, shafts cadmium yellow but black terminally, this black portion extensive on middle pair, some of the more outer feathers with drab or dull white bars or spots, chiefly on outer webs; wing-quills fuscous, shafts cadmium yellow, some of primaries with a few brownish white spots on middle portion of outer webs, secondaries with several large spots of drab on outer webs, both primaries and secondaries with edge of inner webs broadly brownish white or buffy white, these edgings on outer primaries confined to basal portion; upper wing-coverts like back but somewhat lighter; lores and superciliary stripe russet; sides of head, chin, and throat dull vinaceous; short, broad malar stripe and crescent on jugulum black; remainder of lower surface pale vinaceous cinnamon or dull buffy pink, shading to white on crissum, but with numerous round spots of black which on flanks and crissum become bars or V-shaped or hastate markings; lining of wing light cadmium or buff, exteriorly mottled or spotted with dull black. Bill slate, slate black, or blackish slate, somewhat lighter at base; iris hazel, rood brown, or vandyke brown; legs and feet plumbeous, cinereous, or dark gull gray; claws slate color. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male but coloration darker; upper parts more richly brown (less grayish); lower surface more buffy; dark spots often more or less obscured by light tips of feathers. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but malar stripe not black, being same color as throat. *Adult female, winter:* Acquired by

complete postnuptial molt. Like nuptial adult female but differs from nuptial as does adult male in winter. *Male, first nuptial:* Acquired by wear from winter. Similar to nuptial adult male. *Male, first winter:* Acquired by complete postjuvenile molt. Similar to first nuptial male. *Female, first nuptial:* Acquired by wear from first winter. Like nuptial adult female. *Female, first winter:* Acquired by complete postjuvenile molt. Like first nuptial female. *Male, juvenal:* Acquired by postnatal growth. Similar to adult male, but pileum more or less suffused with dull rood brown or tawny; vinaceous areas of head and neck much duller and more grayish, particularly on jugulum; black malar stripe usually duller; black spots on posterior lower parts mostly somewhat larger. *Female, juvenal:* Acquired by postnatal growth. Similar to juvenal male, but black malar patch less distinct. *Natal:* None. Bird hatched unfeathered; naked skin dull white or buff, later becoming more reddish, and finally bluish gray or bluish slate color.

MEASUREMENTS: *Adult male:* Wing, 144.0–153.9 (average, 149.9) mm.; tail, 91.9–115.1 (100.8); bill (exposed culmen), 32.0–36.1 (34.3); tarsus, 25.9–28.9 (27.4); middle (outer anterior) toe without claw, 20.1–22.6 (21.4). *Adult female:* Wing, 137.4–154.9 (150.6); tail, 88.4–104.6 (99.3); bill, 27.9–36.1 (32.8); tarsus, 25.4–28.4 (26.7); middle (outer anterior) toe, 20.1–23.6 (21.6).

RANGE: S.e. Kansas and Tennessee to s.e. Virginia, south to s.e. Texas and s. Florida.

TEXAS: *Breeding:* Altitudinal range, near sea level to 800 ft. Collected northeast to Bowie, south to Orange (Feb. 20), west to Travis (formerly) and McLennan (formerly) cos. Uncommon and local. *Winter:* Taken north to Dallas, east to Jefferson, south to Cameron, west to Val Verde cos. Uncommon.

NESTING: *Nest:* Similar to that of *C. a. luteus* (see below), but average egg size, 25.9 × 20.6 mm.

NORTHERN YELLOW-SHAFTED FLICKER, *Colaptes auratus luteus* Bangs

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. a. auratus* but decidedly larger.

MEASUREMENTS: *Adult male:* Wing, 153.9–165.1 (average, 156.2) mm.; tail, 96.5–112.0 (105.6); bill (exposed culmen), 31.0–39.9 (34.8); tarsus, 26.4–31.0 (28.2); middle (outer anterior) toe without claw, 20.1–23.1 (21.4). *Adult female:* Wing, 149.6–159.5 (154.9); tail, 97.1–115.1 (103.6); bill, 31.0–38.6 (33.8); tarsus, 26.4–29.4 (27.7); middle (outer anterior) toe, 20.1–23.6 (21.9).

RANGE: E. Colorado and Michigan to Newfoundland, south to n. Texas and s.w. South Carolina. Winters irregularly in breeding range, south to s. Texas and n. Florida.

TEXAS: *Breeding:* Altitudinal range, 400 to 3,700 ft. Collected northwest to Lipscomb, east to Wilbarger (eggs), Cooke, and Dallas cos. Uncommon and local. *Winter:* Taken north to Dallas, east to Chambers (Oct. 20), south to Cameron, west to Kerr cos. Common.

NESTING: *Nest:* In forests, open woodlands, open country, including orchards, other cultivated lands, and shade trees about houses; burrow, usually in dead wood, made by the birds in tree trunk, stump, fence post, telephone pole, or in nest box, often high above ground, or even in hole in an earth bank; only material, fine chips of wood. *Eggs:* 3–20, usually 6–8 (one female laid 71 eggs in 73 days when an egg was removed each day); short ovate to elliptical ovate, subpyriform, or oval; very glossy; white, unmarked; average size, 27.9 × 21.6 mm.

BOREAL YELLOW-SHAFTED FLICKER, *Colaptes auratus borealis* Ridgway

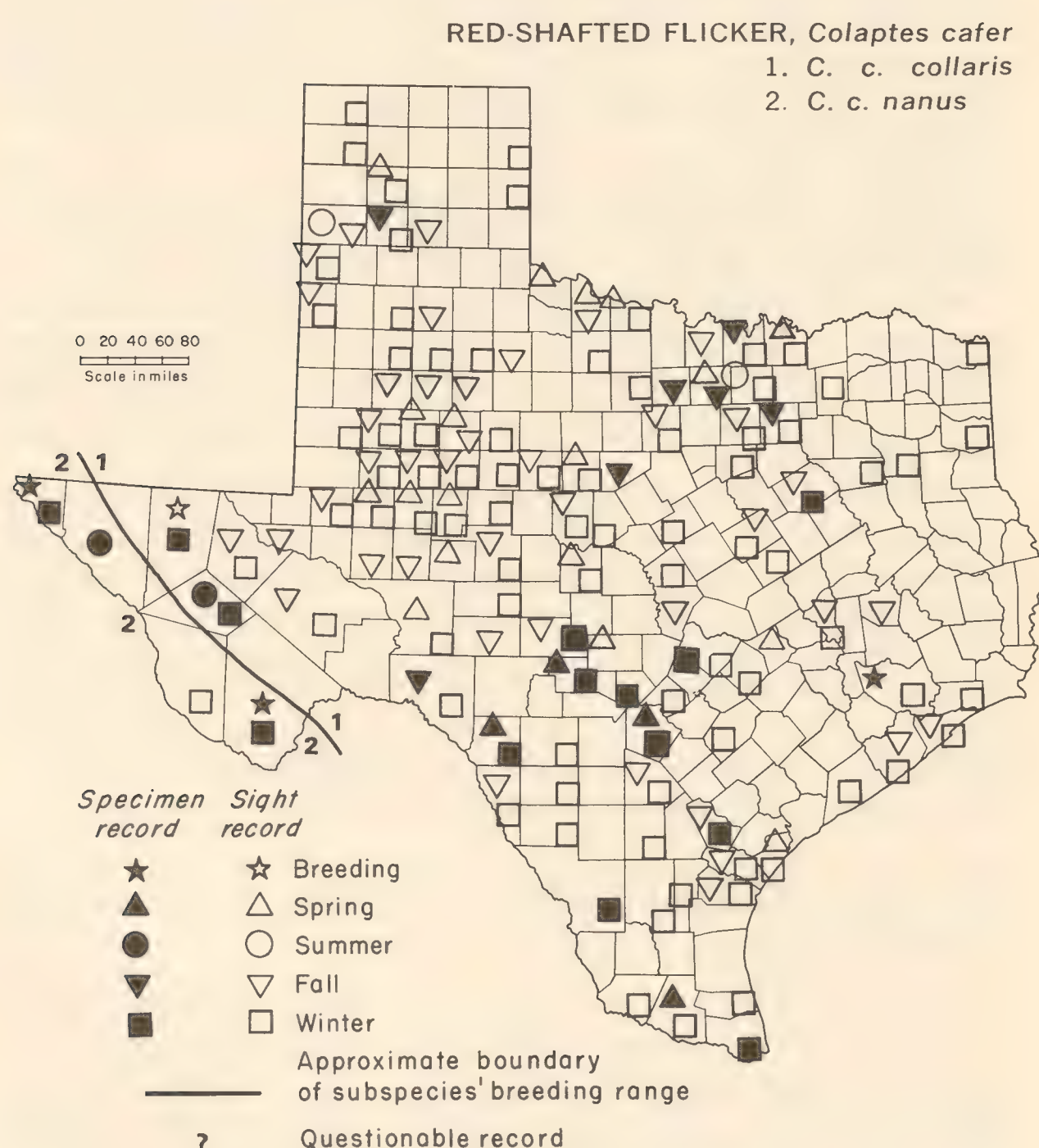
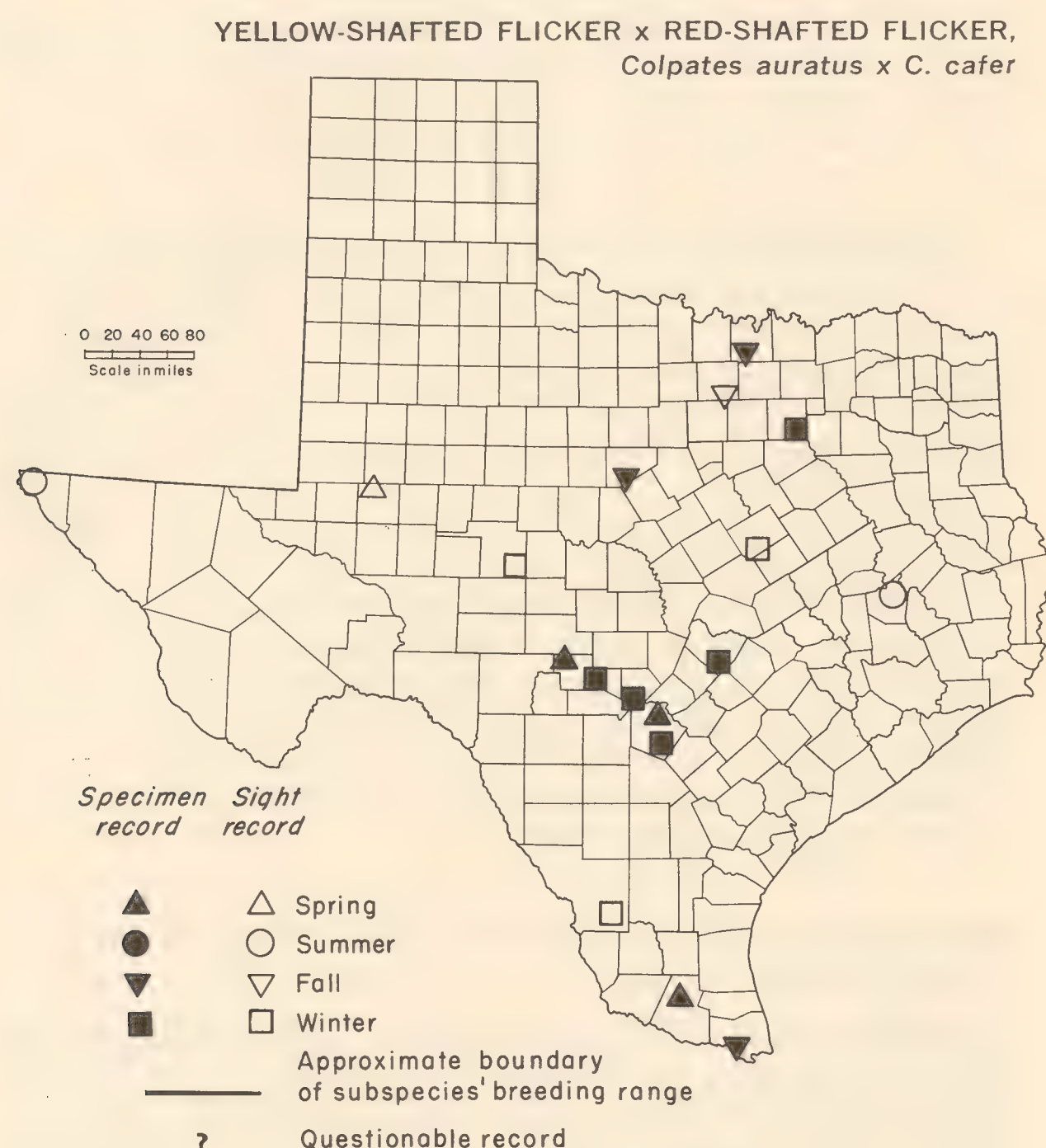
DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. a. luteus*, but wing longer and otherwise larger.

MEASUREMENTS: *Adult male:* Wing, 155.9–169.9 (average, 162.8) mm.; tail, 102.6–115.1 (106.9); bill (exposed culmen), 34.5–39.9 (36.6); tarsus, 26.9–31.5 (28.9); middle (outer anterior) toe without claw, 21.1–24.4 (22.6). *Adult female:* Wing,

155.9–170.9 (162.1); tail, 99.1–115.1 (105.4); bill, 32.5–38.6 (35.6); tarsus, 27.4–30.5 (28.7); middle (outer anterior) toe, 21.1–23.6 (22.4).

RANGE: E. Alaska and n. Saskatchewan to Labrador, south to n.e. Wyoming. Winters from n. Idaho, s. Minnesota, and New Brunswick to s.w. California and n. Florida.

TEXAS: *Winter*: Taken north to Cooke, east to Orange, south to Cameron, west to Atascosa and Kimble cos. Uncommon.



RED-SHAFTED FLICKER, *Colaptes cafer* (Gmelin)

SPECIES ACCOUNT

Resembles Yellowshaft, with which it interbreeds, but under surface of wings and tail red (not yellow); brown cap lacks red at nape; gray face, throat (male has red "mustache"). Hybrids reflect a blending of characteristics: many have orange or salmon wing- and tail-linings; "mustache" may be red on one side, black on the other. Length, 12¾ in.; wingspan, 20¾; weight, 5 oz.

RANGE: S.e. Alaska to s.w. Saskatchewan and c. North Dakota, south through w. United States and upland and highland Mexico to n. Nicaragua. Migratory in northern portion of range, wintering south to Mexico and Texas. Hybridizes with Yellowshaft through western Great Plains.

TEXAS: (See map.) *Breeding*: Early May to late July (eggs, May 29; young being fed, June 2) from possibly 1,900 to 8,500 ft. Uncommon in mountains of Trans-Pecos; scarce and local in northern Panhandle (nesting suspected). Eggs collected during nineteenth century in Harris Co. (see detailed account). *Winter*: Early Oct. to late Mar. (extremes: Aug. 2, May 1). Common west of 100th meridian; fairly common to uncommon in remainder of western two-thirds; scarce along coast; rare in most of eastern third.

HAUNTS AND HABITS: The Red-shafted Flicker is the western version of the Yellow-shafted Flicker. Formerly the Great Plains separated the two birds, but when the white man planted shade trees and shelter belts suitable for flicker nesting, the stage was set for hybridization. Texas is too far south for the hatching of many hybrids, but the state is a great wintering ground for birds of mixed blood. Nesters in Trans-Pecos Texas frequent sparsely wooded foothills, mountain slopes, and canyons; wintering birds often scatter to timber along streams in broad valleys and more level country. It is a common bird in the vicinity of human habitations. While not a gregarious species, individuals occasionally gather into small companies.

Flight of the Redshaft is strong, sometimes well sustained, and normally quite undulating. Its habits are much like those of the Yellowshaft. *Colaptes cafer* forages in trees and thickets as well as on the ground for beetles, ants, crickets, caterpillars, spiders, and wild berries and seeds. Frequently during cooler months it excavates a hole in a wooden building to use as a night roost.

The *wick wick wick wick*, etc., and other vocalizations of this flicker are very similar to those of the Yellowshaft; however, G. F. Simmons has described Redshaft calls as coarser, rougher, and heavier than those of its relative. During spring its loud, staccato drumming is performed on a hollow limb, metal roof, or other resonant object.

DETAILED ACCOUNT: TWO SUBSPECIES

WESTERN RED-SHAFTED FLICKER, *Colaptes cafer collaris* Vigors

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead russet or dull cinnamon; crown and hindneck hair brown to brownish neutral gray, often much washed with cinnamon; back, scapulars, and wing-coverts drab or brownish drab with rather narrow bars of white; rump and shorter tail-coverts white, longer tail-coverts barred with grayish white and black; tail feathers dull black, the shafts, except for terminal portion, flame scarlet, feathers more or less spotted on some of outer webs with brownish white or pale drab, and outer feathers tipped with same; wing-quills fuscous or dark olive brown, shafts flame scarlet, outer webs of middle portion of primaries with a few spots of brownish white, primaries tipped with brownish white or light drab, secondaries broadly barred on outer webs with color of back and tipped with paler, more grayish tint of same, inner webs of secondaries spotted with dull pale salmon pink or pinkish white, basal portion of inner webs of primaries broadly margined with same; lores and superciliary stripe russet; sides of head and of neck, chin, and throat mouse gray; broad malar stripe scarlet red; broad jugular crescent black; remainder of lower surface light drab, becoming dull white or buffy white on posterior portion, and sprinkled with numerous roundish spots of black which on crissum become broad bars or broad U-shaped markings; under surface of tail basally deep coral red, except for black feather tips; under wing-coverts salmon pink, edges of wing-quills underneath basally deep salmon pink; under surface of wing-quills dull orange-red terminally, becoming fuscous on edges. Bill slate color, brownish black, or slate black, rather paler basally; iris chestnut, claret brown, or deep cherry red; legs and feet slate color, plumbeous, dark plumbeous, light gray, greenish slate, or slaty blue. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male but coloration darker and richer. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but malar stripe not red, instead plain gray like remainder of throat. Bill black or dull black; iris brown; legs and feet slaty blue or light blue. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female but coloration darker and richer. *Male, first nuptial:* Acquired by wear from first winter. Very similar to nuptial adult male. *Male, first winter:* Acquired by complete postjuvenile molt. Very closely resembling adult male in winter. *Female, first nuptial:* Acquired by wear from first winter. Like nuptial adult female. *Female, first winter:* Acquired by complete postjuvenile molt. Practically identical with adult female in winter. *Male, juvenal:* Acquired by postnatal growth. Similar to adult male, but colors everywhere duller; lower parts paler, anterior lower surface much paler and drab rather than gray; red malar stripe duller, black jugular crescent smaller; feathers more or less edged with pale drab or dull white; spots of lower surface smaller; ground color more whitish. Bill brownish black or dusky neutral gray; iris dark sepia, chestnut, or bister; feet and toes slate blue or light bluish gray. *Female, juvenal:* Acquired by postnatal growth. Similar to juvenal male, but malar stripe drab instead of scarlet. *Natal:* None. Bird hatched unfeathered; skin dull white.

MEASUREMENTS: *Adult male:* Wing, 155.9–174.0 (average, 165.9) mm.; tail, 101.1–120.9 (112.8); bill (exposed culmen), 33.5–39.9 (37.8); tarsus, 26.9–32.0 (29.7); middle (outer anterior) toe without claw, 20.6–23.9 (22.4). *Adult female:* Wing, 151.9–173.0 (163.3); tail, 99.6–119.9 (109.7); bill, 34.0–41.4 (36.8); tarsus, 26.9–31.5 (28.7); middle (outer anterior) toe, 20.1–23.1 (21.9).

RANGE: S.e. British Columbia and s. Alberta, south to Zacatecas and n. Tamaulipas. Largely resident, wintering east casually to w. Arkansas.

TEXAS: *Breeding:* Altitudinal range, 3,000 to 8,500 ft. Collected in Culberson and Jeff Davis cos. Locally fairly common. Eggs taken in Harris Co. (May 29, 1886, W. H. Lewis; collection of Chicago Natural History Museum). *Winter:* Taken

north to Randall (Sept. 30), east to Navarro, south to Cameron, west to Brewster and El Paso cos. Fairly common.

NESTING: *Nest:* On plains and in mountains and valleys, along watercourses, in scattered timber, or about ranches and cultivated areas; hole made by the birds in tree, stub, side of house, post, telephone pole, or even in sandy bank or bridge abutment, sometimes in nest box; nest material usually fine chips of wood. *Eggs:* 4–12, usually 6–7; short ovate to elliptical ovate or oval; glossy; white, unmarked; average size, 28.4 × 21.6 mm.

DWARF RED-SHAFTED FLICKER, *Colaptes cafer nanus* Griscom

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. c. collaris* but very much smaller; upper parts paler, more grayish.

MEASUREMENTS: *Adult male:* Wing, 141.0–149.1 (average, 144.8) mm.; tail, 98.1–103.1 (100.3); bill (exposed culmen), 34.5–36.1 (35.3); tarsus, 26.9–27.9 (27.7); middle (outer anterior) toe without claw, 20.1–20.6 (20.3). *Adult female:* Wing, 128.3–154.9 (147.3); tail, 96.5–105.9 (100.6); bill, (36.1); tarsus, (27.4); middle (outer anterior) toe, (19.6).

RANGE: Chihuahua and extreme w. and s. Trans-Pecos Texas, south to San Luis Potosí and c. Tamaulipas.

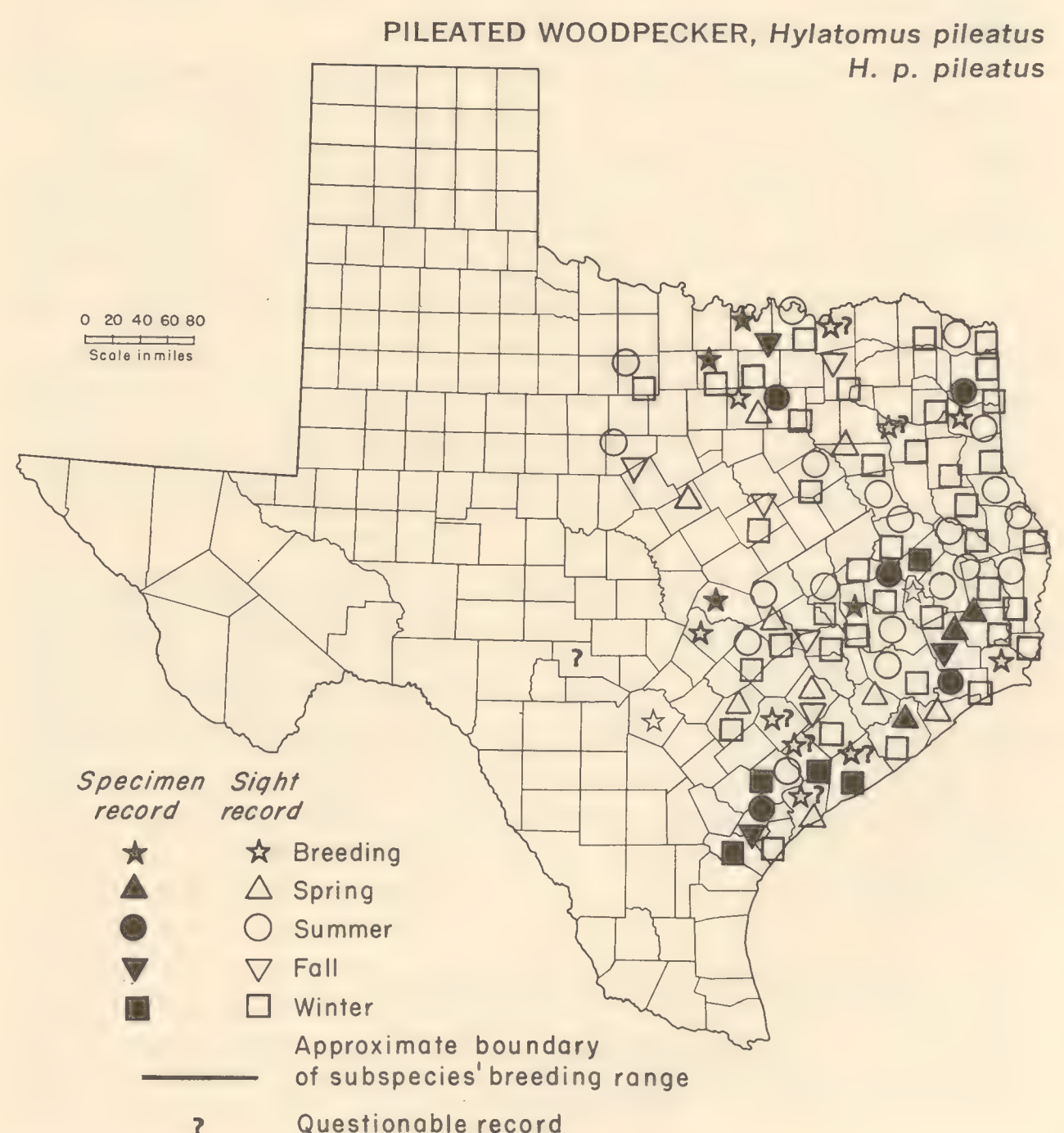
TEXAS: *Resident:* Altitudinal breeding range, 1,900 to 5,000 ft., probably higher. Collected in El Paso, Hudspeth, and Brewster cos. Uncommon and local.

NESTING: Probably similar to that of *C. c. collaris*, but eggs slightly smaller.

PILEATED WOODPECKER, *Hylatomus pileatus* (Linnaeus)

SPECIES ACCOUNT

Dryocopus pileatus of A.O.U. check-list, 1957 (see Appendix A). An impressive, crow-sized woodpecker. Largely black with prominent red crest and white



stripes on face and neck; large white area on forepart of underwing conspicuous in flight. *Male*: red cap (from forehead to crest) and malar stripe. *Female*: blackish forehead, malar stripe; restricted red cap. Length, 16½ in.; wingspan, 26¾.

RANGE: Extensive forests from c. and n.e. British Columbia, s. Mackenzie, and s. Manitoba to Nova Scotia, south to c. California, w. Montana, e. Texas, Gulf coast, and s. Florida.

TEXAS: (See map.) *Resident*: Breeds, mid-Mar. to early June (eggs, Mar. 27 to May 16; young in nest on May 21) from near sea level to 750 ft.—formerly about 1,200 ft. Fairly common locally to uncommon in wooded portions of eastern third, west casually to Gainesville and Fort Worth, rarely to Bastrop and Palmetto State Park (breeding suspected), south irregularly to Victoria (breeding suspected). Formerly (19th century) resident west to Young, Eastland, Williamson, Travis, and Bexar, south to Calhoun cos. *Vagrant*: Continues to recede as a breeder from western limits of range, where it is becoming an increasingly rare visitor. Casual south, chiefly during nonbreeding season, to San Patricio and Aransas cos.; apparently accidental in Kerr Co. (1 reported prior to 1911, H. Lacey).

HAUNTS AND HABITS: The Pileated, one of the two great woodpeckers of the United States, is as adaptable at the other, the Ivory-billed, is overspecialized. In Texas, however, it does not flourish as much as do the smaller Red-bellied and Downy woodpeckers in the same habitat. On its east Texas range, as elsewhere, the Pileated resides in thick forests, preferring rivers, streams, bayous, and swamps lined with baldcypress, cottonwoods, oaks, and pines. Sometimes it visits fringes of woodlands near cultivated fields and rarely ventures into trees near dwellings. Usually solitary, it is generally seen singly or in pairs.

Flight, although swift and powerful, is ordinarily rather deliberate and direct, lacking the marked undulations of ordinary woodpecker flight. The Pileated forages in the upper parts of trees, about decayed stumps and fallen logs, and on the ground, chiefly for wood-boring insects, their eggs and larvae. Usually shy and wary, the bird, at the slightest alarm, takes to remoter parts of the woods or hides behind a tree trunk. A large, somewhat triangular-shaped nest hole excavated usually in a dead tree is characteristic of *Hylatomus pileatus*.

The Pileated Woodpecker's *kuk-kuk-kukkuk—kuk-kuk*, etc., most common of its vocalizations, resembles a flicker call, but is louder, stronger, lower keyed, and more irregular. A *cac, cac, cac* uttered as the bird flies has also been described. Drumming heard in the spring is a distinctive roll which speeds up then fades at the end.

DETAILED ACCOUNT: ONE SUBSPECIES

SOUTHERN PILEATED WOODPECKER, *Hylatomus pileatus pileatus* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear

from winter plumage. Top of head and short crest spectrum red, somewhat darker on forehead; posterior part of lores, region about eye, and postocular stripes that meet across hind-neck dull chaetura black; narrow stripe above and behind eye white; broad stripe from outer nasal tufts across lower part of lores and side of head to sides of neck and down to side of breast white, becoming yellowish white anteriorly and passing into dull naples yellow or maize yellow on anterior part of lores; hindneck and entire upper surface, including wings and tail, chaetura black, two or three outermost primaries with small whitish spots on outer webs near tips; under wing-coverts and basal portion of primaries and secondaries white, forming conspicuous white patch on wing when spread; edge of wing under alula white; broad malar stripe carmine; chin and upper throat yellowish white, middle portion obscurely streaked with chaetura drab; posterior extension of malar stripe and lower throat, jugulum, and remaining lower surface chaetura drab or chaetura black, sides and flanks with narrow obscure bars of dull white; lining of wing yellowish white. Maxilla slate color or slate gray, darker at tip; mandible bluish white basally shading through light grayish blue or bluish gray to slate color or slate gray terminally; naked skin about eyes grayish olive; iris orange-red, straw yellow, naples yellow, buff, buff yellow, or cream color; legs and feet black, space between scales gray or grayish white. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but forehead and fore part of crown yellowish brown, grayish brown, or grayish olive; red malar stripe of male replaced by stripe of chaetura drab or chaetura black. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial*: Acquired by wear from first winter. Practically identical with nuptial adult male. *Male, first winter*: Acquired by complete postjuvenile molt. Practically identical with first nuptial male. *Female, first nuptial*: Acquired by wear from first winter. Like nuptial adult female. *Female, first winter*: Acquired by complete postjuvenile molt. Like first nuptial female, but feathers of forehead with pale edgings. *Male, juvenal*: Acquired by postnatal growth. Similar to nuptial adult male, but red of head paler and duller, that of malar stripe mixed with dull black or buff; upper and lower parts softer, rather lighter, duller, and more brownish; primaries tipped with dull white. Bill dull white. *Female, juvenal*: Acquired by postnatal growth. Similar to nuptial adult female, but colors everywhere duller, more brownish, and rather paler; forehead dark gray or blackish. *Natal*: None. Bird hatched unfeathered; skin dull white.

MEASUREMENTS: *Adult male*: Wing, 220.0–235.0 (average, 228.3) mm.; tail, 144.0–161.0 (152.7); bill (exposed culmen), 46.0–52.6 (49.8); tarsus, 33.0–35.1 (34.3); middle (outer anterior) toe without claw, 25.9–28.4 (27.2). *Adult female*: Wing, 214.1–232.9 (221.7); tail, 140.0–158.5 (149.9); bill, 41.4–49.0 (44.7); tarsus, 31.0–34.5 (32.5); middle (outer anterior) toe, 23.9–27.4 (25.4).

RANGE: N. Missouri to s. Pennsylvania, south to c. Texas and s. Florida.

TEXAS: *Resident*: Collected north to Cooke, east to Marion and Chambers, south to Victoria, west to Williamson (eggs, 19th century) and Wise (eggs, 19th century) cos.

NESTING: *Nest*: In heavy deciduous or coniferous forests, or dry or wet more open woods; burrow in tree, often high above ground, with oval or triangular-shaped entrance; nest material, a few chips of wood. *Eggs*: 3–8, usually 3–5; ovate to rounded ovate or elliptical ovate; very glossy; white, unmarked; average size, 32.5 × 24.1 mm.

RED-BELLIED WOODPECKER, *Centurus carolinus* (Linnaeus)

SPECIES ACCOUNT

A medium-sized “zebra-backed” (barred black-and-

white above) woodpecker with white upper tail-coverts and white bars on inner feathers of black tail; buffy gray face and under parts with red tinge on middle of belly; dark red eyes. *Male*: red crown, nape. *Female*: gray crown; red nape. Length, 9½ in.; wingspan, 16¼; weight, 2¾ oz.

RANGE: S. Great Lakes region to Delaware, south to n., c., and e. Texas and Florida Keys.

TEXAS: (See map.) *Resident*: Breeds, late Mar. to late July (eggs, Apr. 5 to July 9) from near sea level to about 3,200 ft. Common to fairly common in northern Panhandle (local) and most of eastern half, west to Wilbarger, Eastland (breeding suspected), Travis, and Kendall (breeding conceivable) cos., south to Goliad (breeding suspected), Victoria, and Calhoun cos.; scarce and local south to Welder Wildlife Refuge and Rockport. Formerly (19th century) bred west locally to San Angelo. *Vagrant*: Scarce to rare visitor, chiefly during nonbreeding season, west onto Edwards Plateau, south to Alice and Corpus Christi; casual in Rio Grande delta.

HAUNTS AND HABITS: In many localities throughout the wooded eastern third of Texas, the Red-bellied is the woodpecker which nowadays thrives best. It lives in open stands of coniferous or deciduous timber, especially pines, cottonwoods, oaks, and elms, on the edges of clearings and deadenings, and along rivers and streams. Occasionally it visits the borders of fields where such adjoin woodlands and it moves into shade trees of towns and cities. The Redbelly, not gregarious, is normally seen singly or in pairs.

Flight and behavior are typical of the Dryocopidae. The bird generally moves in short bursts from tree to tree, rarely descending to the ground. On tree trunks

and limbs the Redbelly gleans beetles, ants, flies, grasshoppers, and acorns, wild seeds, and fruits; it also stores nuts, insects, and other food in cracks and crevices of trees and fence posts. In city and suburb it comes readily to feeding trays where it eats quantities of watermelon pulp, cantaloupe seeds, and greasy table scraps, especially fried cornbread.

As in most woodpeckers, the male Redbelly's bill is larger than the female's, a difference which allows him to probe a bit deeper for food but not to have very different feeding habits. However, in West Indian woodpeckers, with their radically dimorphic bills, differing food habits are apparently well developed.

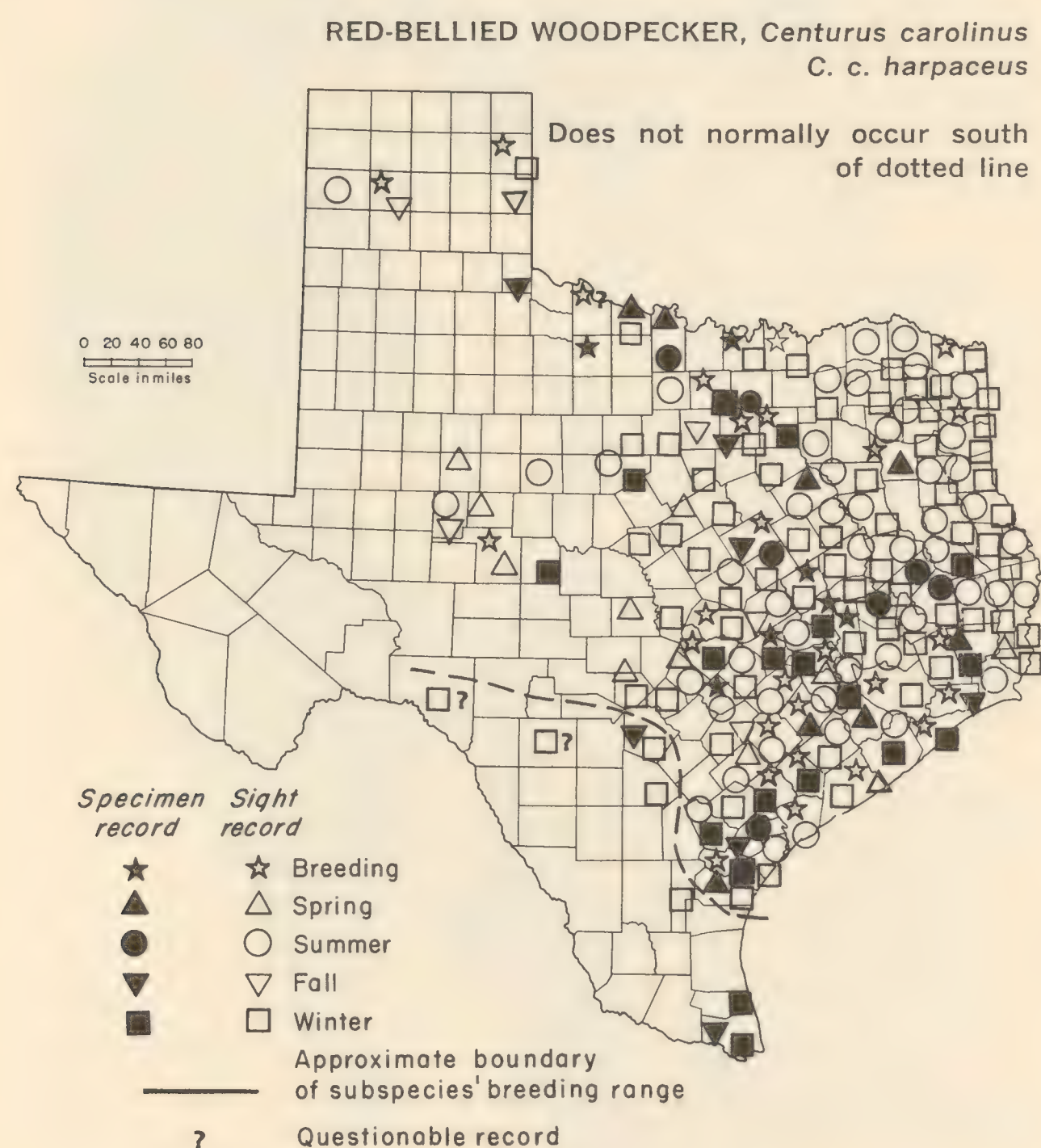
A noisy bird, the Red-bellied Woodpecker frequently utters a soft, scolding *churr* or *cherr* or *chaw* several times repeated; also a *chiv*, *chiv* has been described.

DETAILED ACCOUNT: ONE SUBSPECIES

TEXAS RED-BELLIED WOODPECKER, *Centurus carolinus harpaceus* Koelz

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt and wear from winter plumage. Forehead buffy, overlaid with scarlet; crown and hindneck spectrum red, becoming scarlet posteriorly; lower hindneck, back, scapulars, and rump black, narrowly barred with white; upper tail-coverts white, shorter ones broadly barred with dull black, longer ones with spots of same; tail dull black, two middle feathers barred on inner webs with white, and with long white streak on shaft portion of outer web in middle of feather, outer pair of rectrices barred with white, next pair narrowly tipped with white; primaries chaetura drab, inner feathers narrowly tipped with white, some of middle feathers with white spots on middle portion of outer webs, and large white spots on basal portion of inner webs; secondaries chaetura black, outer feathers spotted, inner ones barred, on both webs with white; wing-quills dull black or chaetura black and spotted with white; sides of head and of neck and entire lower surface dull pale buffy gray, middle of abdomen with distinct tinge of dull red; flanks and crissum yellowish or buffy white, former barred, latter streaked, with hair brown or chaetura drab; lining of wing white, barred with hair brown or chaetura drab. Bill black or slate black, but mandible slate color; naked orbital space olive gray; iris dark reddish brown or scarlet; legs and feet dull sage green; claws black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by partial prenuptial molt and wear from winter. Similar to nuptial adult male, but anterior part of pileum dull gray instead of red; occiput sometimes mixed with dull black; red on middle portion of abdomen paler and less extensive. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Male, first nuptial*: Acquired by partial prenuptial molt. Like nuptial adult male. *Male, first winter*: Acquired by complete postjuvenile molt. Much like adult male in winter, but forehead duller or somewhat dotted with black. *Female, first nuptial*: Acquired by partial prenuptial molt. Like nuptial adult female. *Female, first winter*: Acquired by complete postjuvenile molt. Essentially like adult female in winter. *Male, juvenal*: Acquired by postnatal growth. Similar to adult female, but colors duller, black barring of upper surface more blended, head without red; hindneck with tinge of pink; crown dull gray with only reddish tinge; lower surface duller and more dingy, jugulum with rather obscure dark shaft streaks, middle of abdomen with little or no tinge of red. Bill shorter; iris brown. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but pileum darker and duller. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 123.5–138.9 (average,





Red-bellied Woodpecker, *Centurus carolinus*



Acorn Woodpecker, *Balanosphyra formicivora*

131.0) mm.; tail, 72.4–85.1 (77.7); bill (exposed culmen), 27.9–33.0 (29.7); tarsus, 20.1–23.1 (21.9); middle (outer anterior) toe without claw, 16.5–20.1 (17.8). *Adult female*: Wing, 121.9–133.1 (128.3); tail, 68.1–83.6 (77.2); bill, 25.4–29.9 (27.7); tarsus, 20.1–22.1 (21.1); middle (outer anterior) toe, 16.5–18.0 (17.3).

RANGE: S.e. South Dakota to s.e. Ontario, south to s.e. Texas and w. Mississippi.

TEXAS: *Resident*: Collected north to Childress, Wichita, and Cooke, east to Smith and Hardin, south to Refugio, west to Travis, Concho (19th century), and Eastland cos. *Vagrant*: Collected in Nueces, Willacy, and Cameron cos.

NESTING: *Nest*: In forests, wooded parks, strips of timber along streams, and edges of prairies; excavation usually made by the birds (both sexes) in tree trunk, large limb, stump, pole, post, or bird box, sometimes high above ground; lining consists of small bits of wood. *Eggs*: 3–8, usually 4–5; ovate to elliptical ovate; glossy; dull white, unmarked; average size, 25.1 × 18.5 mm.

GOLDEN-FRONTED WOODPECKER, *Centurus aurifrons* (Wagler)

SPECIES ACCOUNT

Closely resembles Redbelly, but inner tail feathers solid black, rather than barred (entire tail appears black above); middle of belly tinged with yellow. *Male*: yellow forehead; gray crown (interrupting bright colors), with central red patch; orange nape. *Female*: lacks red on crown; has yellow forehead, nape. Length, 10 in.; wingspan, 17; weight, 2¾ oz.

RANGE: Texas and s.w. Oklahoma, south through c., e., and s. Mexico to n. Nicaragua.

TEXAS: (See map.) *Resident*: Breeds, early Mar. to late July (eggs, Mar. 30 to July 6) from near sea level to 4,000 ft. Common to fairly common from northern Panhandle (local) and Wilbarger Co. to northern Brewster Co. (local), Del Rio, Kerrville, south Texas brush country, central coast, and Austin (increasingly local). *Vagrant*: Rare visitor to Bailey Co., Midland vicinity, southern Brewster Co., Bastrop, Giddings (Lee Co.), Waco, and Dallas–Fort Worth area. Casual on upper coast.

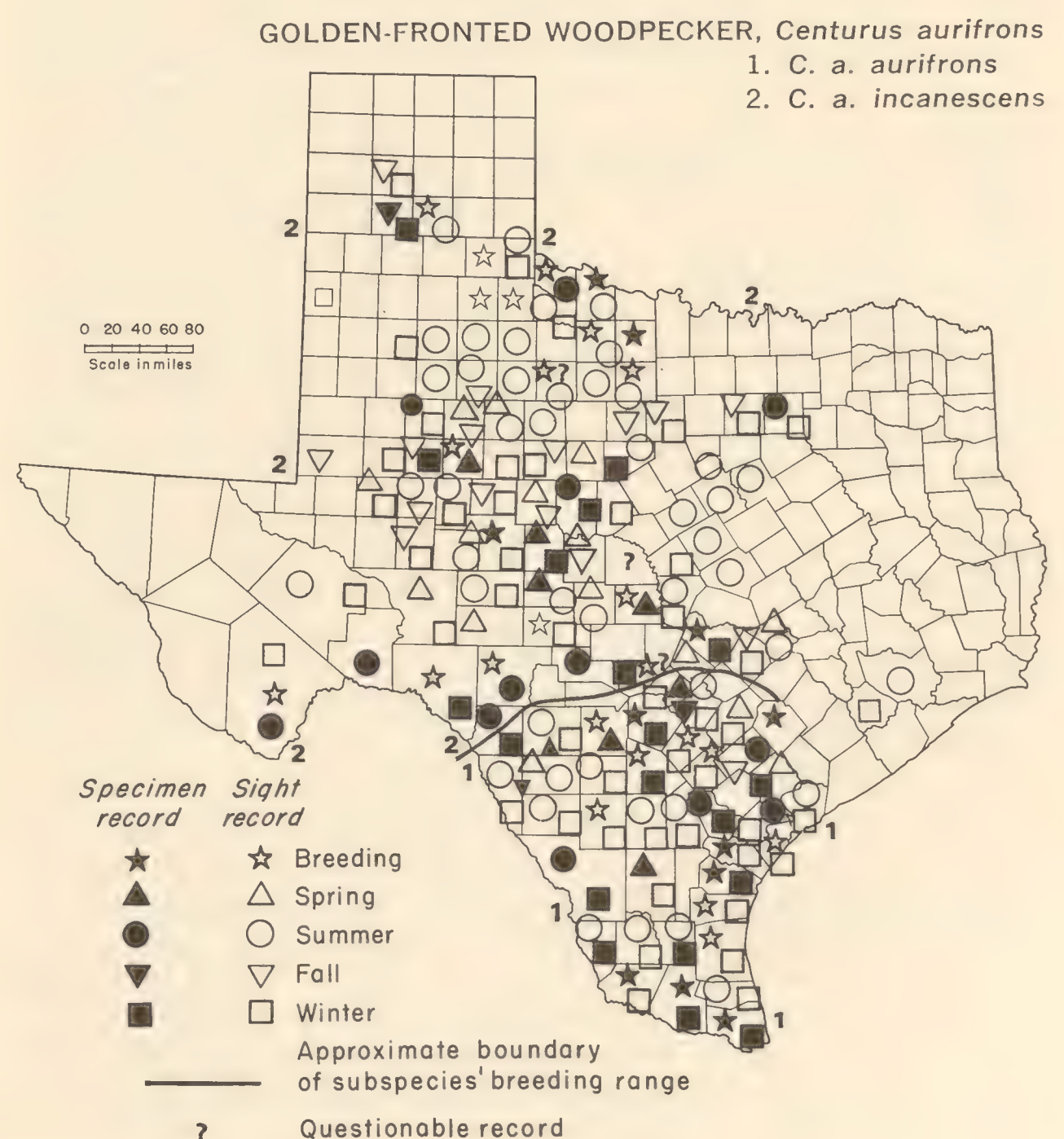
HAUNTS AND HABITS: In pecan groves and mesquite pastures from the Panhandle to the Gulf of Mexico, the strident cackle of the Golden-fronted Woodpecker is one of the frequent natural sounds. Over most of Texas' semiarid brush country, the Goldenfront and Ladderback are the only resident woodpeckers. Goldenfronts commonly come to the vicinity of dwellings, especially if surrounding brush is thick, and even to parks of cities and towns. During the breeding season, the species is generally seen singly or in pairs, while at other times it may gather in small loose companies.

Flight, characteristically woodpecker, is undulating, strong, swift, and seldom sustained. The active and noisy Goldenfront behaves much like its close relative, the Red-bellied Woodpecker. The present bird works through upper portions of trees, but gleans as well at their bases, in thickets, and even on the ground for beetles, ants, and grasshoppers; also acorns, berries, wild fruits, and occasionally citrus. It is partial to pe-

can nuts and often tries to store them. Usually the storage place is in the top of a broken-off stub. Sometimes a vertical open-ended pipe is used. As the hard-working Goldenfront drops pecan after pecan into the depths of the pipe, the bird always seems surprised when the nut suddenly disappears. Seldom, if ever, does the woodpecker fill a standing pipe all the way to the top.

Goldenfront vocalizations are quite similar to those of the Redbelly, but when heard together in the field the two are distinguishable. The rolling *churr*, *churr*, *churr*'s and cackling *kek*, *kek*, *kek*, *kek*'s of the Goldenfront are louder and harsher than the calls of the Redbelly. The louder notes of the Goldenfront are biologically useful since they allow individuals on widely spaced trees in their dryland habitat to communicate. The medium-heavy drumming heard in the south Texas brush country in early spring comes from the Goldenfront; the lighter tapping is made by the only other breeding woodpecker of the region, the Ladderback.

CHANGES: Since 1933 the mesquite (*Prosopis*) trees throughout all the Golden-fronted Woodpecker's U.S. range have been under siege. Ranchers, often with the aid of a U.S. Soil Conservation Service subsidy, have tried to eradicate *Prosopis* from their rangeland, acting under the theory that the only plants that should grow are livestock-nourishing grasses. As of 1970, mesquite trees on at least twelve million Texas acres had been killed or disrupted by means of bulldozers, root plows, herbicides, etc. This massive, continuing assault is bound to have adverse effects on the Golden-fronted Woodpecker and other birds whose lives are closely tied to mesquite trees. As yet there has been no dramatic range shrinkage, but beginning about 1960



Goldenfronts were noticeably less numerous in the Austin region of central Texas than they had been previously in the twentieth century.

DETAILED ACCOUNT: TWO SUBSPECIES

WAGLER'S GOLDEN-FRONTED WOODPECKER, *Centurus aurifrons aurifrons* (Wagler)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Forehead and bristly nasal tufts cadmium yellow; pileum mouse gray, anteriorly paler and more buffy, central crown-patch spectrum red; patch on hindneck cadmium orange, sometimes mixed with bright red; lower hindneck, back, scapulars, and wing-coverts black with numerous narrow bars of white; lower rump and upper tail-coverts white, laterally slightly spotted or streaked with dull black; tail dull black, three or four outer feathers tipped with white or yellowish white, second pair barred on terminal portion of outer webs and a little on inner webs with yellowish or brownish white; wing-quills dull black or fuscous black, primaries narrowly tipped with white and with broad bars of white at base, secondaries tipped with white and barred or spotted on both webs with white, tertials completely barred with white; sides of head and of neck and entire lower surface pale buffy drab gray, more whitish on chin and tinged with cadmium yellow on sides and anterior part of chin; middle of abdomen cadmium yellow; sides and flanks dull white, barred with chaetura drab or chaetura black; lining of wing white, barred with chaetura black. Bill dull black or slate black; paler at base of mandible; iris dark red; legs and feet grayish olive green, black, or bluish. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but without red on head, entire crown being brownish gray; yellow of forehead duller, as is also yellow on hindneck, and usually without admixture of red or tinge of orange; yellow on abdomen duller and less extensive. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial:* Acquired by wear from first winter. Similar to nuptial adult male. *Male, first winter:* Acquired by complete postjuvinal molt. Practically same as first nuptial male. *Female, first nuptial:* Acquired by wear from first winter. Like nuptial adult female. *Female, first winter:* Acquired by complete postjuvinal molt. Like first nuptial female. *Male, juvenal:* Acquired by postnatal growth. Similar to nuptial adult male but much duller and more brownish buff above and below; nasal tufts dull brownish gray with slight tinge of yellow; crown with narrow fuscous bars on brownish gray portions, its red patch smaller, and gray of occiput washed with yellow; light bars of upper surface duller, more obscure; jugulum, breast, and sides barred or streaked narrowly with fuscous, somewhat washed with yellow. Bill shorter. *Female, juvenal:* Acquired by postnatal growth. Similar to juvenal male but without red on crown; yellow on hindneck even lighter and duller. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 129.0–144.0 (average, 136.1) mm.; tail, 72.9–83.1 (79.7); bill (exposed culmen), 29.9–35.1 (33.0); tarsus, 22.1–24.9 (23.6); middle (outer anterior) toe without claw, 17.0–20.6 (19.3). *Adult female:* Wing, 127.0–134.6 (131.8); tail, 70.6–82.0 (76.7); bill, 26.9–32.5 (30.2); tarsus, 21.1–24.9 (22.9); middle (outer anterior) toe, 18.0–20.1 (18.8).

RANGE: E. Coahuila and s. Texas, south to Jalisco and Hidalgo.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 900 ft. Collected north to Uvalde and Comal, east to Lavaca (eggs), south to Cameron, west to Maverick cos. Common.

NESTING: *Nest:* On bottomlands or uplands; in brush, low woods, sometimes cultivated areas; in dead or living mesquite or other tree, fence post, or telephone pole, occasionally in nest box; hole made by the bird; usually with bits of wood as lining. *Eggs:* 4–7, usually 4–5; ovate to short ovate or rounded ovate; glossy; pure white, unmarked; average size, 25.9 × 19.6 mm.

NORTHERN GOLDEN-FRONTED WOODPECKER, *Centurus aurifrons incanescens* Todd

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *C. a. aurifrons*, but somewhat lighter on upper parts with broader dark bars and narrower white ones; rump and upper tail-coverts with very little or no black; lower surface somewhat lighter.

MEASUREMENTS: Similar to those of *C. a. aurifrons*.

RANGE: S.w. Oklahoma and n. and c. Texas, south to n.e. Chihuahua.

TEXAS: *Resident:* Altitudinal breeding range, 900 to 4,000 ft. Collected north to Randall, east to Archer (eggs) and Eastland, south to Travis, west to Val Verde and Brewster cos. Locally common. *Vagrant:* One specimen: Dallas Co., Dallas (July 31, 1897, W. A. Mayer).

RED-HEADED WOODPECKER, *Melanerpes erythrocephalus* (Linnaeus)

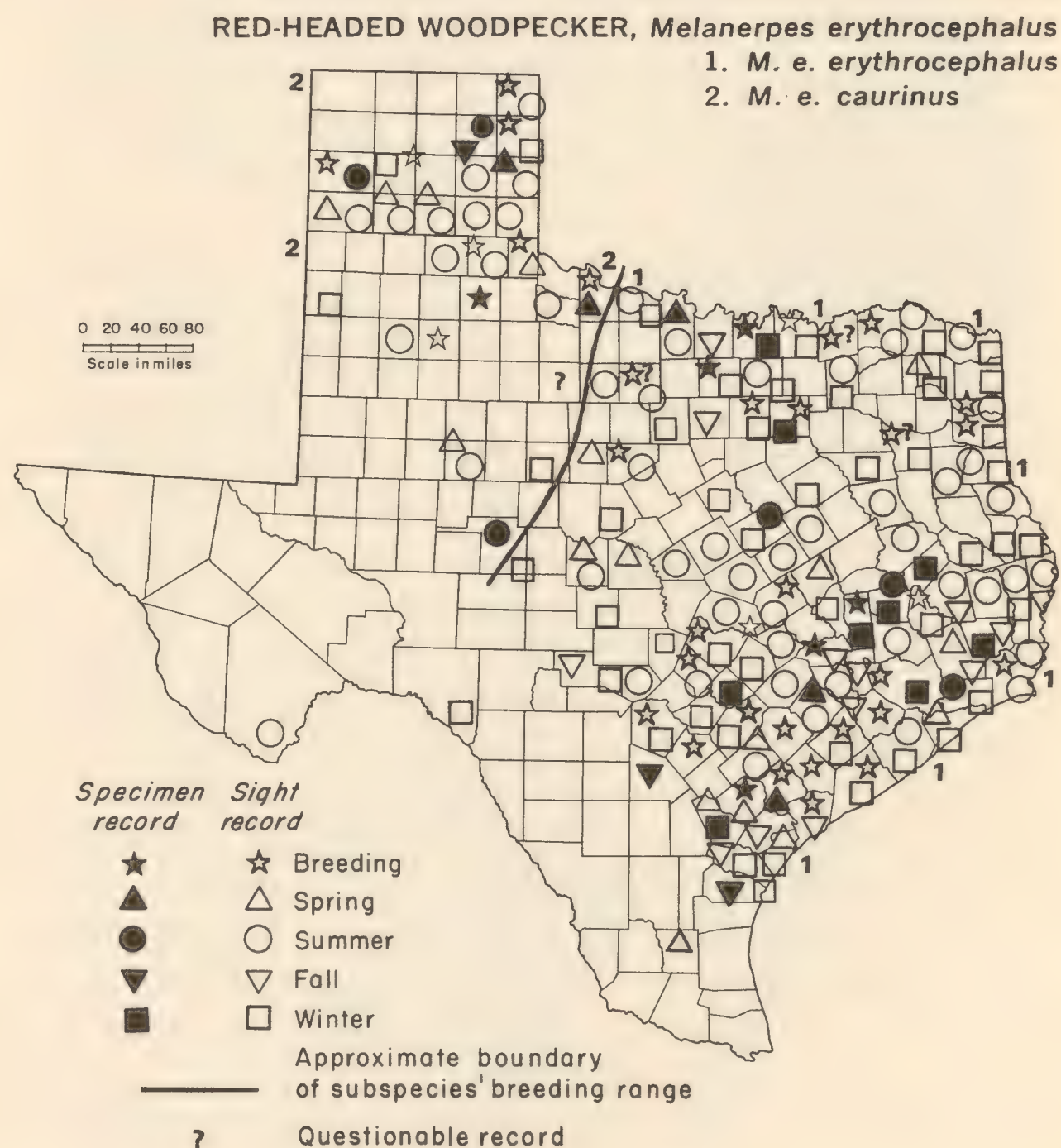
SPECIES ACCOUNT

See colorplate 15

Boldly patterned red, white, and blue-black; the only U.S. woodpecker east of the Rockies whose entire head is red. Solid black back, tail; white rump, under parts; large white patch on rear edge of black wings—equally conspicuous at rest or in flight. Length, 9½ in.; wingspan, 17¾; weight, 2½ oz.

RANGE: Extreme s. Canada east of Rockies, south through c. and e. United States to Gulf states. Post-breeding birds irregularly withdraw from northern portions of range.

TEXAS: (See map.) *Resident:* Breeds, late Feb. to late Aug. (eggs, Mar. 5 to July 18; young in nest to Aug. 15) from near sea level to 4,000 ft. Fairly common to uncommon in northern and middle Panhandle and in eastern portion west to Vernon, Fort Worth



(very irregularly Throckmorton and Eastland cos.), Waco, Austin, and Palmetto State Park, south to Goliad, Victoria, and Calhoun cos.; rare and highly irregular southwest to San Antonio. *Vagrant*: Scarce to rare, chiefly from early Oct. to late Mar., west to 101st meridian, south to Del Rio, San Antonio, and Corpus Christi; casual at Big Bend Nat. Park and in and near Rio Grande delta. Occasional southward flights—notably during Oct.—to San Antonio vicinity and central coast sometimes impressive.

HAUNTS AND HABITS: Most woodpecker species show a red patch on the head, at least in the male; the Red-headed Woodpecker is the only one in temperate eastern North America in which the entire head is red. In Texas, as elsewhere, the present species seeks more open parts of forests, groves of trees scattered on prairies, and fringes of timber along streams. Quite unshy, it is frequently seen about cultivated areas, on fence posts, near country dwellings, and in yards and gardens of towns. While not in the true sense gregarious, it does appear in small loose companies.

Flight is ordinarily undulating but sometimes more direct than that of many other woodpeckers. Occasionally it darts out into the air to catch a passing insect. In trees and on the ground, the Redhead forages for beetles, ants, wasps, bugs, grasshoppers, and spiders as well as wild fruits, seeds, and nuts. Like the Acorn Woodpecker, it stores acorns and other nuts for later use, but rather than boring individual storage holes for each nut as does the Acorn, it stashes nuts in any available cavity or niche in trees, buildings, fences, or telephone poles.

The Red-headed Woodpecker has a variety of harsh, resounding notes. The common call is a loud, raucous *queer, queer, queer* or *queeoh*; another is *tchur-tchur*. One alarm has been described as a harsh rattle said to be indistinguishable from the notes of a treefrog.

CHANGES: In central Texas, especially around the city of Austin, the Red-headed Woodpecker has slowly declined during the twentieth century. A similar decrease in Louisiana has been blamed on the introduced Starling. However, in Texas the main slump occurred in the 1920's before there were any Starlings to compete for nest holes. Because of their habit of feeding on the ground, Redheads have been reported to be especially subject to being hit by automobiles; however, this is an unlikely theory for their decline. In sum, real causes of the diminution of this species remain obscure.

DETAILED ACCOUNT: TWO SUBSPECIES

EASTERN RED-HEADED WOODPECKER, *Melanerpes erythrocephalus erythrocephalus* (Linnaeus)

DESCRIPTION: *Adults, nuptial plumage:* Acquired by wear or partial prenuptial molt. Entire head and neck carmine red; back, scapulars, and wing-coverts black with metallic greenish or bluish sheen; rump and upper tail-coverts white; tail dull black, outermost short tail feathers white, first long tail feather from outer side with margin of white on outer web, also wholly white at base, and with white tip, next pair tipped with dull white and white at base, fourth pair with some white at base and narrow white tip; primaries dull black; secondaries and tertials

white with black shafts; narrow black collar around posterior border of red neck; remainder of lower parts white; inner under wing-coverts and axillars white; outer coverts metallic greenish black or bluish black like back. Bill bluish white or light bluish gray basally, dull black or plumbeous terminally and on culmen; iris burnt umber, chestnut, or hazel; legs and feet greenish gray; claws black. *Adults, winter:* Acquired by complete postnuptial molt. Like nuptial adults. *Second winter:* Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial:* Acquired by partial prenuptial molt. Similar to nuptial adults, but upper surface duller, secondaries and tertials with some black markings. *First winter:* Acquired by partial postjuvenile molt, continuous with following first prenuptial molt. Similar to adults in winter, but is a transition in varying combinations of juvenile and first nuptial. *Juvenile:* Acquired by postnatal growth. Head and neck all around rather rufescent hair brown speckled or streaked with chaetura black; chin and throat paler and more conspicuously and broadly streaked; mantle dull chaetura black, tipped with light hair brown; rump and upper tail-coverts white; tail as in adult; wings fuscous black; secondaries white, broadly barred terminally with dull black or chaetura black; wing-coverts like back; lower parts dull white or buffy white; lining of wing white, edge of wing dull hair brown. Bill shorter. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 134.6–145.0 (average, 138.2) mm.; tail, 70.1–75.4 (73.2); bill (exposed culmen), 24.9–28.9 (26.2); tarsus, 22.1–23.6 (22.9); middle (outer anterior) toe without claw, 17.0–18.0 (17.5). *Adult female:* Wing, 133.6–138.4 (135.6); tail, 72.4–77.0 (74.4); bill, 24.9–25.9 (25.4); tarsus, 21.1–22.1 (21.9); middle (outer anterior) toe, 17.0–18.0 (17.5).

RANGE: E. North Dakota to s.w. Quebec (casually), south to c. Texas and s. Florida. In winter withdraws irregularly from extreme northern portions of breeding range.

TEXAS: *Resident:* Altitudinal breeding range, near sea level to 2,000 ft. Collected north to Clay and Cooke, east to Hardin and Chambers, south to Victoria, west to Bexar cos. Fairly common.

NESTING: *Nest:* In open woodlands, forests, open country, or cultivated areas, often in timber along streams; cavity made by the bird at various heights above ground; in tree, telephone pole, or fence post; eggs laid on a few chips of wood. *Eggs:* 4–10, usually 5; short ovate to rounded ovate; somewhat glossy; white, unmarked; average size, 25.1 × 19.3 mm.

WESTERN RED-HEADED WOODPECKER, *Melanerpes erythrocephalus caurinus* Brodtkorb

DESCRIPTION: *Adults, nuptial plumage:* Similar to *M. e. erythrocephalus* but larger; middle of abdomen nearly always decidedly tinged with red.

MEASUREMENTS: *Adult male:* Wing, 142.0–149.6 (average, 145.8) mm.; tail, 72.4–81.0 (77.2); bill (exposed culmen), 26.4–27.9 (27.2); tarsus, 22.6–24.4 (23.6); middle (outer anterior) toe without claw, 17.5–19.0 (18.3). *Adult female:* Wing, 140.0–144.0 (142.7); tail, 73.9–84.6 (78.2); bill, 26.9–29.9 (27.7); tarsus, 20.6–23.9 (22.4); middle (outer anterior) toe, 18.0–19.0 (18.5).

RANGE: S.e. Alberta to s. Manitoba, south to c. New Mexico and s. Oklahoma. In winter withdraws from northern half of breeding range.

TEXAS: *Resident:* Altitudinal breeding range, 1,200 to 4,000 ft. Collected north to Roberts and Wheeler, east to Wilbarger, south to Motley (eggs), west to Oldham cos. Fairly common.

NESTING: Similar to that of *M. e. erythrocephalus*.

ACORN WOODPECKER, *Balanosphyra formicivora* (Swainson)

SPECIES ACCOUNT

Melanerpes formicivorus of A.O.U. check-list, 1957

(see Appendix A). Ant-eating Woodpecker and California Woodpecker of some writers. A gregarious woodpecker. Black-backed with white rump, wing-patch; black-and-white face; yellowish throat; black breast, side-streaks; white belly; whitish eyes. *Male*: whitish forehead bordered posteriorly by red cap. *Female*: black band separates light forehead from restricted red cap. Length, $9\frac{1}{4}$ in.; wingspan, $17\frac{1}{2}$; weight, $2\frac{3}{4}$ oz.

RANGE: W. Oregon (locally), California west of Sierra Nevada, Arizona, New Mexico, and w. Texas, south through highlands of Mexico (also Pacific and Caribbean lowlands of Chiapas) and Central America to w. Panama.

TEXAS: (See map.) *Resident*: Breeds, late Apr. to mid-Aug. (eggs, May 6 to 18; young in nest to Aug. 5) from possibly 2,100 to 8,500 ft. Common to fairly common in Guadalupe, Davis (breeding suspected), and Chisos mts.; uncommon and local in nearby mountains of Trans-Pecos. *Vagrant*: Rare visitor to El Paso, Midland region, northern Panhandle, and Edwards Plateau (breeding conceivable); casual east to Bastrop and Houston.

HAUNTS AND HABITS: The bizarrely patterned Acorn Woodpecker is so named because it stores acorns in acorn-sized holes in tree trunks. In the western United States, the bird inhabits pine-oak woodlands, usually in mountains or hills but often at sea level in California. The few individuals which have been found on Texas' Edwards Plateau were in patches of juniper-oak woods. Very social, the species feeds and nests together in loose colonies.

Flight of the Acorn is characteristic of woodpeckers, but not so strong or swift as that of some other members of the family. Although not a quarrelsome bird, it

vigorously protects its nesting hole and caches of acorns against intrusions by squirrels and jays. Several of these woodpeckers have been observed sharing a roost in a tree cavity at night.

The noisy Acorn Woodpecker utters parrotlike calls; distinctive is a jeering, raucous *whack-up*, *whack-up*, *whack-up* or *ja-cob*, *ja-cob*, *ja-cob*.

DETAILED ACCOUNT: TWO SUBSPECIES

NUEVO LEON ACORN WOODPECKER, *Balanosphyra formicivora phasma* Oberholser, new subspecies (see Appendix A)

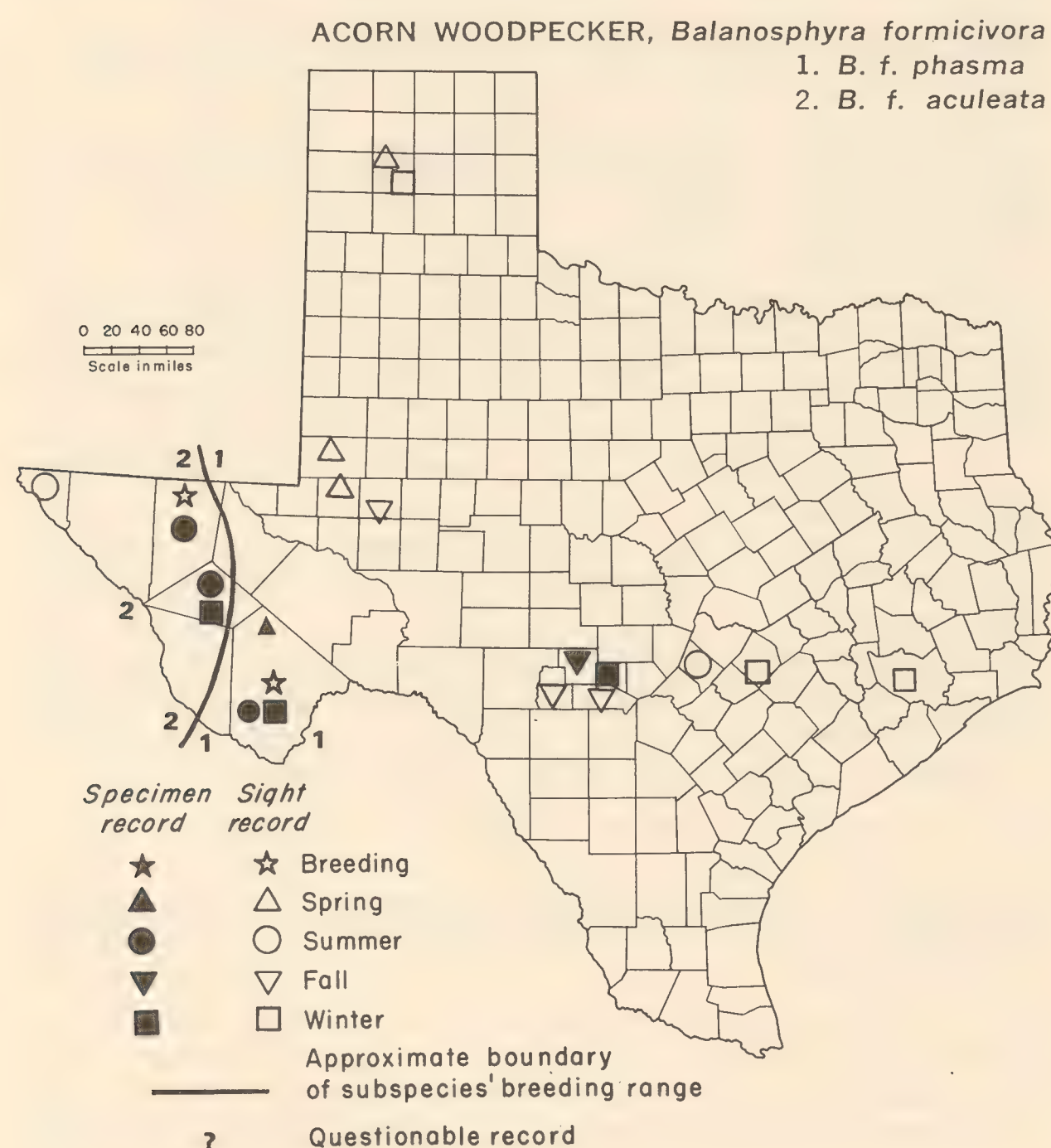
DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Bristly nasal tufts black; forehead and narrow bar across middle of lores yellowish white; crown and occiput spectrum red; back, scapulars, rump, and upper wing-coverts black with metallic greenish gloss; upper tail-coverts white; tail black with faint metallic greenish gloss; wing-quills dull black or fuscous black, but primaries with broad white bar basally; secondaries broadly margined on inner webs with white except at tips; tertials with little or no white on this portion; ocular region, postocular area, and sides of neck dull black with metallic greenish tinge; chin black, slightly tinged with metallic greenish; maxillary stripe connecting with throat white; throat primrose or pale sulphur yellow; jugulum and upper breast dull black, with small central anterior spot of carmine, posteriorly much streaked with white, particularly in middle; posterior lower parts white, sides and flanks narrowly streaked with hair brown or chaetura black, as are shorter lower tail-coverts; lining of wing white anteriorly, but on outer portion black with metallic greenish gloss, edge of wing, however, white. Bill black; iris white, sometimes pale venetian pink or dull yellow on outer portion; legs and feet sage green or dark greenish gray; claws brownish black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Similar to nuptial adult male, but crown glossy black like back, instead of red like occiput. Bill, legs, and feet olivaceous black; iris white. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Similar to corresponding sex of adult in winter. *Male and female, first nuptial*: Acquired by wear from first winter. Like corresponding sex of nuptial adult, but outer tail feather with two white spots on each web. *Male and female, first winter*: Acquired by partial postjuvenile molt. Like first nuptial male and female. *Male, juvenile*: Acquired by postnatal growth. Similar to nuptial adult male, but bill shorter; black of nasal tufts, chin, and breast duller; yellow of throat paler; sides and flanks with less distinct though more numerous blackish streaks; tertials and scapulars with white tips; two outer pairs of tail feathers tipped with white and with two white spots on each web of outermost tail feather on each side; base of mandible light brown; iris bluish white. *Female, juvenile*: Acquired by postnatal growth. Similar to juvenile male, but crown mostly black. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 127.0–141.0 (average, 135.1) mm.; tail, 66.0–76.5 (72.2); bill (exposed culmen), 24.9–29.4 (27.2); height of bill at base, 7.1–9.1 (8.1); tarsus, 20.1–23.6 (21.6); middle toe without claw, 15.5–19.0 (17.3). *Adult female*: Wing, 130.5–140.0 (134.9); tail, 67.1–77.0 (72.2); bill, 23.1–28.4 (25.9); height of bill, 6.9–8.6 (8.1); tarsus, 20.1–22.1 (20.6); middle toe, 14.5–18.8 (17.0).

TYPE: Adult male, no. 183784, U.S. National Museum, Biological Surveys collection; Cerro de la Silla, Nuevo León, Mexico; Mar. 24, 1902; E. W. Nelson and E. A. Goldman, original no., 8525.

RANGE: S. Trans-Pecos Texas, south to Coahuila and s. Tamaulipas.

TEXAS: *Resident*: Altitudinal breeding range, possibly 2,100 to



7,800 ft. Collected in Chisos Mts., Brewster Co. Common. *Vagrant*: Three specimens: Kerr Co., Harris Lake (Dec. 12, 1895, H. P. Attwater; Nov. 25, 1894, Dec. 11, 1895, H. Lacey).

NESTING: Similar to that of *B. f. aculeata* (see below), but average egg size, 26.4×19.0 mm.

MEARNS' ACORN WOODPECKER, *Balanosphyra formicivora aculeata* (Mearns)

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *B. f. phasma*, but tail and wing longer. Bill and middle toe decidedly shorter.

MEASUREMENTS: *Adult male*: Wing, 136.9–145.0 (average, 140.5) mm.; tail, 70.1–83.1 (76.2); bill (exposed culmen), 24.4–25.9 (25.1); tarsus, 20.1–22.6 (21.6); middle (outer anterior) toe without claw, 15.5–17.0 (16.5). *Adult female*: Wing, 134.1–144.0 (139.2); tail, 70.1–81.0 (78.2); bill, 22.1–25.9 (23.6); tarsus, 20.1–22.1 (20.9); middle (outer anterior) toe, 15.0–18.0 (16.3).

RANGE: N.w. Arizona to n. Trans-Pecos Texas, southwest to Durango.

TEXAS: *Resident*: Altitudinal breeding range, 5,000 to 8,500 ft. Collected in Culberson, Jeff Davis, and n. Brewster cos. Locally common.

NESTING: *Nest*: On hills, mountains, plateaus, and mesas; chiefly in pine or oak woodlands, hole made by the birds in dead or living tree; only nest material, a few small chips of wood. *Eggs*: 3–17 (latter number probably laid by two females), usually 4–5; rounded ovate or short ovate to elongate ovate; with but little gloss; white, unmarked; average size, 23.9×19.0 mm.

LEWIS' WOODPECKER, *Asyndesmus lewis* (Gray)

SPECIES ACCOUNT

See colorplate 16

A rather large dark woodpecker, crowlike in flight, with pale gray collar (around hindneck) and breast; rose red belly; dark red face; blackish green head,

back, rump, wings, tail. Length, $10\frac{3}{4}$ in.; wingspan, 21.

RANGE: S. British Columbia to s.w. South Dakota, south to s. California and s. New Mexico. Migratory in northern portion, wintering chiefly from Oregon and Colorado southward; irregularly reaches n.w. Mexico and w. Texas.

TEXAS: (See map.) *Summer*: One sighting: Limpia Creek, Davis Mts. (July 12, 1901, Vernon Bailey). *Winter*: Late Dec. to late Apr. (extremes: Dec. 19, May 17). Rare and erratic visitor to western two-thirds, east to Dallas and Austin vicinities, where casual.

HAUNTS AND HABITS: Western North America is home for two of the world's most unusual woodpeckers—Lewis' Woodpecker and Williamson's Sapsucker. Unwoodpeckerlike, Lewis' flies steadily and straight in the manner of a crow; also it sails a good bit and flycatches expertly. Furthermore, the peculiar silver-pink or rose of its belly is rare in the bird world. (The Pink-headed Warbler of highland Chiapas and Guatemala is one of the very few others which exhibit this color.)

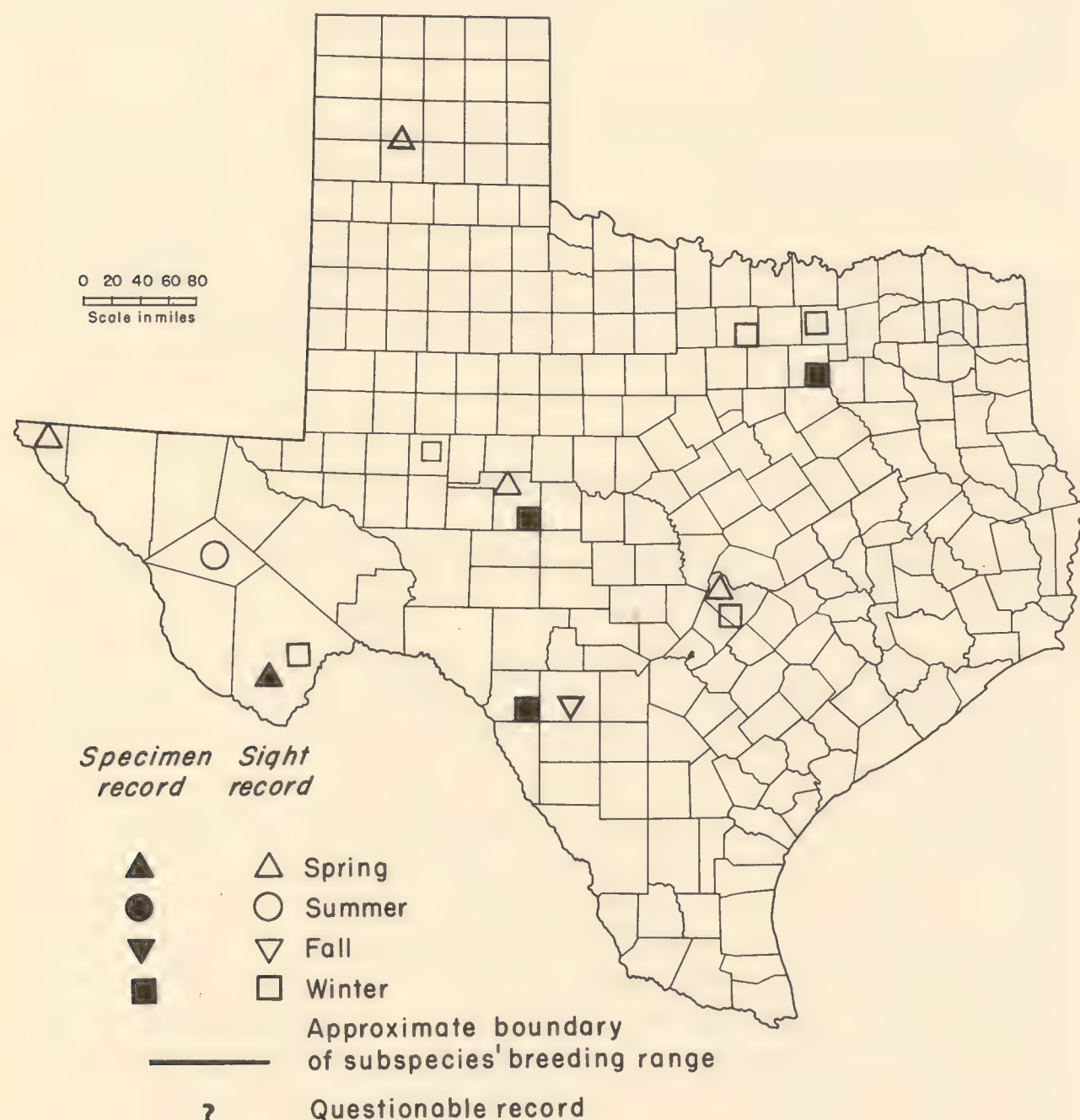
On the breeding grounds, the species frequents open country with scattered trees, rather than heavy forests; it is particularly attracted to burned-over tracts, but is found also on the fringes of pine and juniper groves and in deciduous timber, especially cottonwoods, along streams. The Lewis' nest hole is typically excavated in a dead—often fire-blackened—tree. The bird, an extensive wanderer, irregularly visits Texas, chiefly in winter, seeking situations similar to its summer habitat. This woodpecker is sometimes gregarious during migration.

Unusually silent, the Lewis' Woodpecker infrequently utters a harsh *churr* or *chee-ur* and a high-pitched *chee-up*. Most vocalizing occurs in migrating flocks or when the birds first arrive on the breeding grounds in spring. Near the nest, adults exchange a rattling *ick-ick-ick* call. Young in the nest hiss like other nestling woodpeckers. The adult male's drumming is reported to be "lazy" and confined to the early part of the breeding season—chiefly May.

DETAILED ACCOUNT: NO SUBSPECIES

DESCRIPTION: *Adults, nuptial plumage*: Acquired by wear from winter plumage. Upper parts, including wings and tail, metallic dusky olive green, verging to blackish green sheen on pileum, and with narrow grayish white collar on hindneck; forehead, lores, sides of head below eye, chin, and upper throat ox-blood red or dark carmine; lower throat and jugulum grayish white or pale silvery gray, chaetura black bases of feathers showing through in places, this grayish color extending up sides of neck in collar to join gray on hindneck; remainder of sides of neck, flanks, and crissum metallic green like upper parts; remainder of lower surface spectrum red or rose red, very fresh plumage sometimes anteriorly rose pink; sides chaetura black, washed with metallic green of upper parts; lining of wing metallic green like upper surface. Bill dull black, purplish slate, or slate black, darker at tip; iris dark hazel, burnt sienna, or black; legs and feet bluish gray or greenish plumbeous; claws black. *Adults, winter*: Acquired by complete postnuptial molt. Like nuptial adults. *First nuptial*: Acquired by wear from first winter. Like nuptial adults. *First winter*: Acquired by complete

LEWIS' WOODPECKER, *Asyndesmus lewis*



postjuvénal molt. Like first nuptial male and female. *Juvenal*: Acquired by postnatal growth. Similar to nuptial adults, but red portions of head fuscous black or chaetura black; pileum much duller, more brownish; grayish white collar absent; lower throat and abdomen fuscous, and somewhat mottled with paler brown; remainder of lower surface similar with obscure buff or brownish white bars, and with only small amount of red along median line of breast and abdomen.

MEASUREMENTS: *Adult male*: Wing, 162.1–180.1 (average, 173.8) mm.; tail, 87.6–102.1 (97.3); bill (exposed culmen), 27.9–33.0 (29.7); tarsus, 23.9–26.4 (25.4); middle (outer anterior) toe without claw, 19.6–21.1 (20.3). *Adult female*: Wing, 164.1–175.0 (169.2); tail, 86.1–96.5 (91.6); bill, 25.4–33.0 (28.7); tarsus, 23.1–25.9 (24.6); middle (outer anterior) toe, 18.0–21.1 (19.8).

TEXAS: *Winter*: Taken in Dallas (1 specimen), Tom Green (2), Kinney (1), and Brewster (1, May 1) cos.

YELLOW-BELLIED SAPSUCKER, *Sphyrapicus varius* (Linnaeus)

SPECIES ACCOUNT

Also known as Common Sapsucker. A woodpecker with longitudinal white wing-stripe and black breast-patch. Red forehead, crown; bold black-and-white face-stripes; black back with white barring; white rump; yellowish or whitish belly. *Male*: red throat-patch. *Female*: white (e. U.S.) or partly red (w. U.S.) throat. Northwestern form (Red-breasted Sapsucker) has solid red head and breast. Length, 8¼ in.; wing-span, 15; weight, 1¾ oz.

RANGE: S.e. Alaska to Newfoundland, south to mountains of s. California, c. Arizona, and n. New Mexico, to c. Missouri and c. New England, and in Appalachians to Georgia. Pacific coast birds and s. Appalachian race largely resident; interior and eastern races highly

migratory, wintering mainly from southern portion of breeding range to Panama; also West Indies.

TEXAS: (See map.) *Summer*: Four records: specimen, Davis Mts. (see detailed account); specimen, Guadalupe Mts. (see detailed account); sighting, Dog Canyon, Guadalupe Mts. (Aug. 10–26, 1901, Vernon Bailey); sighting, Cove, Chambers Co. (July 1–31, 1961, A. K. McKay). *Winter*: Mid-Oct. to early Apr.—a few to late Apr. (extremes: Aug. 28, May 28). Common to uncommon throughout.

HAUNTS AND HABITS: Sapsuckers, of which the Yellow-bellied is the best known species, are so called because they eat some sap in addition to more orthodox woodpecker food. On its breeding grounds, the present bird inhabits forests of both mountains and lowlands, preferably those near water. For a nest, it excavates a hole in a dead or living tree, sometimes a considerable distance above the ground. Throughout Texas, this sapsucker migrates through and winters in pine, post oak, and other woodlands but also seeks more open country, bushes and shrubs about ranch houses, and yards and tree-lined streets of towns and cities. The Yellowbelly makes longer migration journeys than any other U.S. woodpecker, wintering as far south as Central America and the West Indies. Generally solitary, even during winter, the species rarely gathers in companies; however, loose groups, perhaps family parties, are seen during migration.

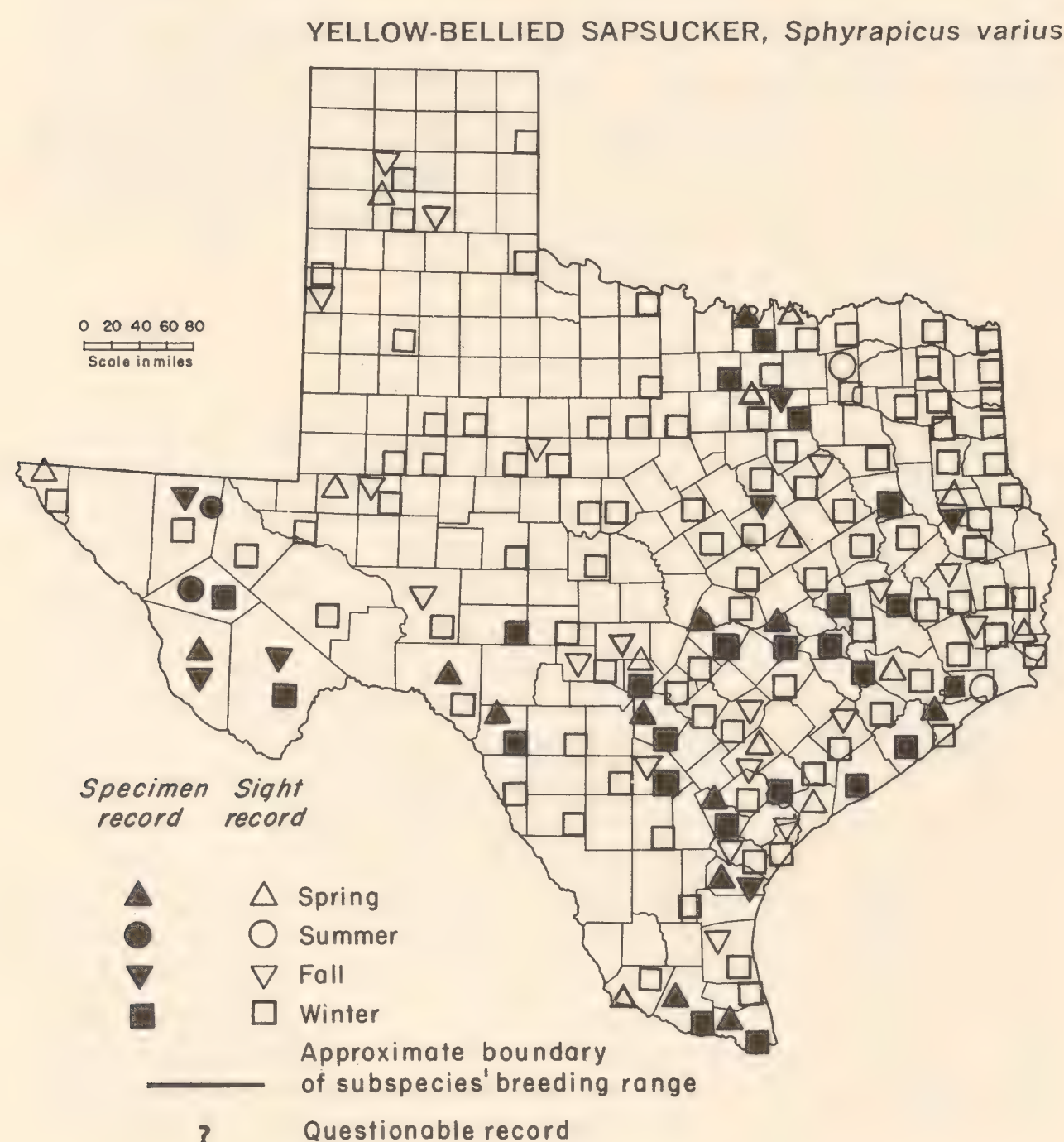
Apparently not as active as some other woodpeckers, the Yellowbelly nonetheless exhibits the strong, swift flight of its family as it undulates from tree to tree. Seldom on the ground, the bird works through trees and bushes tapping bark for sap, eating cambium, and searching for beetles, ants, caterpillars, other bark-dwelling insects, spiders, and some wild fruits. Sapsucker feeding trees are easy to recognize; large patches of the trunk are covered with evenly spaced shallow pits as if the bark had recently been peppered with shotgun pellets.

Of the Yellow-bellied Sapsucker's numerous plaintive squeals and whines, a nasal mewing *cheerrr* or *keeyew*, downward slurred, is most common. On nesting territory in spring, the bird drums a distinctive series of rapid thumps followed by several slow rhythmic ones.

DETAILED ACCOUNT: THREE SUBSPECIES

SOUTHERN YELLOW-BELLIED SAPSUCKER, *Sphyrapicus varius varius* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Forehead and crown carmine; narrow line across forehead and superciliary stripe connected with stripe over occiput glossy black; stripe above eye back to nape and connecting with collar around hindneck white or dull buffy white; remainder of upper surface and wing-coverts black; each side of upper back and whole of lower back much spotted or barred with white, these markings sometimes in shape of two parallel more or less interrupted stripes on each side of upper surface; upper tail-coverts centrally white, lateral feathers with also some white markings; tail dull black or fuscous black, middle feathers broadly barred on inner webs with white, outer



feathers narrowly edged with white terminally, and occasionally with a few white spots on either or both webs; greater coverts white at least on outer webs and forming with outer median and lesser coverts a broad white stripe down side of wing when closed; wing-quills chaetura black, spotted on edges of both webs with white; bristly nasal tufts yellowish white, a broad white stripe connecting with these below eye to side of neck; auricular region and postocular region glossy black or fuscous black; black malar streak, narrower malar stripe, and center of jugulum and upper breast black with greenish metallic gloss, these enclosing carmine area of chin and upper throat; sides of jugulum and remainder of lower surface yellowish white, sides streaked with fuscous or fuscous black; crissum streaked or spotted with same; lining of wing white. Bill black, blackish brown, or slate black, but base of mandible seal brown; iris dark brown; legs and feet mouse gray, olive gray, slate, or grayish olive green; claws slate black or brownish black. *Adult male, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult male, but light areas of upper surface light yellowish olive or light yellowish brown instead of white, light areas of lower surface pale olive yellow instead of yellowish white; ground color of sides buffy brown instead of dull white. Bill more brownish. *Adult female, nuptial*: Acquired by partial pre-nuptial molt. Similar to adult male, but chin and throat white or yellowish white in place of red, and sometimes red of top of head replaced by glossy black. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female but differs in same way as does adult male in winter from nuptial adult male. *Male, first nuptial*: Acquired by partial pre-nuptial molt. Practically identical with nuptial adult male. *Male, first winter*: Acquired by partial postjuvenile molt. This plumage is combination in varying proportions of juvenal and first nuptial male. *Female, first nuptial*: Acquired by partial pre-nuptial molt. Like nuptial adult female. *Female, first winter*: Acquired by partial postjuvenile molt. As in male, this plumage is combination in varying degrees of juvenal and first nuptial female. *Juvenal*: Acquired by postnatal growth. Pileum light olive brown or fuscous, with spots or short streaks of dull buff or buffy brown; remainder of upper surface fuscous black or dull black much barred and spotted with white, dull white, and dull brownish buff; middle part of upper tail-coverts mostly white; sides of head and neck like pileum; broad buffy white postocular stripe and broad rictal stripe of white or buffy white; remainder of sides of neck, with throat and jugulum, dull hair brown or buffy brown, obscurely barred with fuscous or dull black; sides and flanks dull olive brown or yellowish buffy brown, barred or mottled obscurely with fuscous; middle of breast and of abdomen yellowish white or pale buff; crissum same, with shaft streaks of fuscous or chaetura black; wings and tail as in adult in winter; lining of wing white spotted with fuscous. Bill dark sepia or slate color; iris dark bister; legs and feet olive plumbeous.

MEASUREMENTS: *Adult male*: Wing, 115.6–122.5 (average, 118.9) mm.; tail, 64.3–74.2 (69.8); bill (exposed culmen), 19.6–23.6 (21.6); tarsus, 18.0–20.6 (19.8); middle (outer anterior) toe without claw, 14.5–16.0 (15.2). *Adult female*: Wing, 115.6–124.0 (118.9); tail, 64.0–75.9 (69.8); bill, 19.3–22.6 (21.4); tarsus, 17.5–20.6 (19.0); middle (outer anterior) toe, 14.0–16.0 (14.7).

RANGE: N.e. Ohio and Pennsylvania, south to n.w. Georgia. Winters from s. Maryland to s. Texas and Florida; also West Indies (locally) and Guatemala (casually).

TEXAS: *Winter*: Taken in Walker (1 specimen), Brazos (1), Bee (1), and Nueces (1, Mar. 26) cos. Scarce.

NORTHERN YELLOW-BELLIED SAPSUCKER, *Sphyrapicus varius atrothorax* (Lesson)

Race not in A.O.U. check-list, 1957 (see Appendix A).

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *S. v. varius* but larger, particularly wing; upper surface more conspicuously marked with white.

MEASUREMENTS: *Adult male*: Wing, 120.9–128.4 (average,

124.5) mm.; tail, 61.5–77.0 (70.1); bill (exposed culmen), 20.1–24.9 (22.4); tarsus, 18.0–21.0 (19.8); middle (outer anterior) toe without claw, 15.5–17.0 (16.0). *Adult female*: Wing, 119.9–129.0 (125.0); tail, 62.0–75.9 (72.2); bill, 20.1–23.1 (21.4); tarsus, 19.0–21.1 (19.8); middle (outer anterior) toe, 15.0–16.5 (15.7).

RANGE: C. Yukon to Newfoundland, south to w. Iowa and n. New Jersey. Winters from n.e. Kansas and Massachusetts through s.e. United States and c. Mexico to Panama; also West Indies.

TEXAS: *Winter*: Taken north to Cooke, east to Walker and Chambers, south to Cameron, west to Kinney and Presidio (May 28) cos. Common.

RED-NAPED YELLOW-BELLIED SAPSUCKER, *Sphyrapicus varius nuchalis* Baird

DESCRIPTION: *Adult male, nuptial plumage*: Similar to nuptial adult male of *S. v. varius*, but wing and tail longer, and usually with fewer white markings on back, and two stripes on back formed by these markings more conspicuous; nape posterior to black occipital collar with more or less mixture of red; lower parts more strongly tinged with yellow; red of throat more extended, usually spreading over malar region, except anterior portion, and reaching to white subauricular stripe. Bill deep slate color; iris dark brown; legs and feet greenish slate. *Adult female, nuptial*: Similar to nuptial adult female of *S. v. varius*, but with at least posterior part, sometimes whole, of throat red. *Juvenal*: Acquired by postnatal growth. Darker above than juvenal of *S. v. varius*, markings of upper parts less brownish; lower surface less yellowish, jugulum and upper breast more grayish instead of buffy brown and less conspicuously barred. Maxilla dusky neutral gray or brownish slate; mandible quaker drab, brownish slate, or chaetura drab; iris claret brown; legs greenish slate, smoke gray, or storm gray.

MEASUREMENTS: *Adult male*: Wing, 125.0–130.0 (average, 127.8) mm.; tail, 71.1–77.5 (74.2); bill (exposed culmen), 20.6–24.4 (23.4); tarsus, 19.0–21.6 (20.3); middle (outer anterior) toe without claw, 14.5–16.0 (15.2). *Adult female*: Wing, 126.0–130.0 (128.0); tail, 71.1–79.0 (74.2); bill, 20.1–24.4 (23.1); tarsus, 19.0–20.6 (19.8); middle (outer anterior) toe, 14.5–16.0 (15.2).

RANGE: C. British Columbia and s. Alberta, south to n.e. California and n. New Mexico. Winters from e. Oregon and southern portion of breeding range to s. Baja California, Jalisco, and Texas.

TEXAS: *Summer*: Two specimens: Jeff Davis Co., Davis Mts., near Fort Davis (June 29, 1887, W. Lloyd); Culberson Co., The Bowl, 7,800 ft. (female with well-developed ovary, June 3, 1971, G. A. Newman; original no., 240). *Winter*: Taken in Culberson (Oct. 8), Jeff Davis, Presidio (Sept. 30), Brewster, Sutton, and Lee cos. Uncommon.

WILLIAMSON'S SAPSUCKER, *Sphyrapicus thyroideus* (Cassin)

SPECIES ACCOUNT

See colorplate 17

A woodpecker with yellow belly and white rump; sexes are radically different. *Male*: black head (with 2 narrow white face-stripes), back, breast; red throat-patch; black wings, each with large white patch. *Female*: brown head; dull black breast-patch; back, wings, and sides barred blackish and whitish. Length, 8¾ in.; wingspan, 15¾.

RANGE: S. British Columbia to Colorado, south in high mountains to s. California and n. New Mexico. Winters at lower elevations and south irregularly to

n. Baja California, n.w. mainland Mexico (rarely to c. highlands), and w. Texas.

TEXAS: (See map.) *Winter*: Early Oct. to late Mar. (extremes: Sept. 24, May 19). Scarce to rare and irregular visitor to Trans-Pecos and northern Panhandle; casual on Edwards Plateau. One sighting at Austin (Oct. 5, 1963, J. W. White, et al.).

HAUNTS AND HABITS: A mighty strange woodpecker is the Williamson's Sapsucker. In addition to its aberrant sapsucker feeding habit, this species' usual woodpecker red patch (male only) is on the throat exclusively, instead of on the crown or nape. Most astonishing for a member of the Dryocopidae is the great difference in color pattern of the sexes. The female was made known to science by John Cassin in 1851; the male was first described by a Dr. Newberry in 1857. Henceforth, until H. W. Henshaw discovered them nesting together in 1873, the male and female were considered by ornithologists to be very distinct species.

In mountainous regions of western North America, the Williamson's inhabits coniferous forests; here it constructs a cavity in a dead or partially rotten tree for its nest. On its irregular winter visits to western Texas, this sapsucker seeks coniferous and mixed woodlands.

This bird's swift, undulating flight is typical of the woodpecker family. Rarely does it descend to the ground, preferring instead to forage in trees where it feeds on wood-inhabiting insects, sap and cambium, and some wild fruits. Unlike other sapsuckers it seems to prefer pine sap.

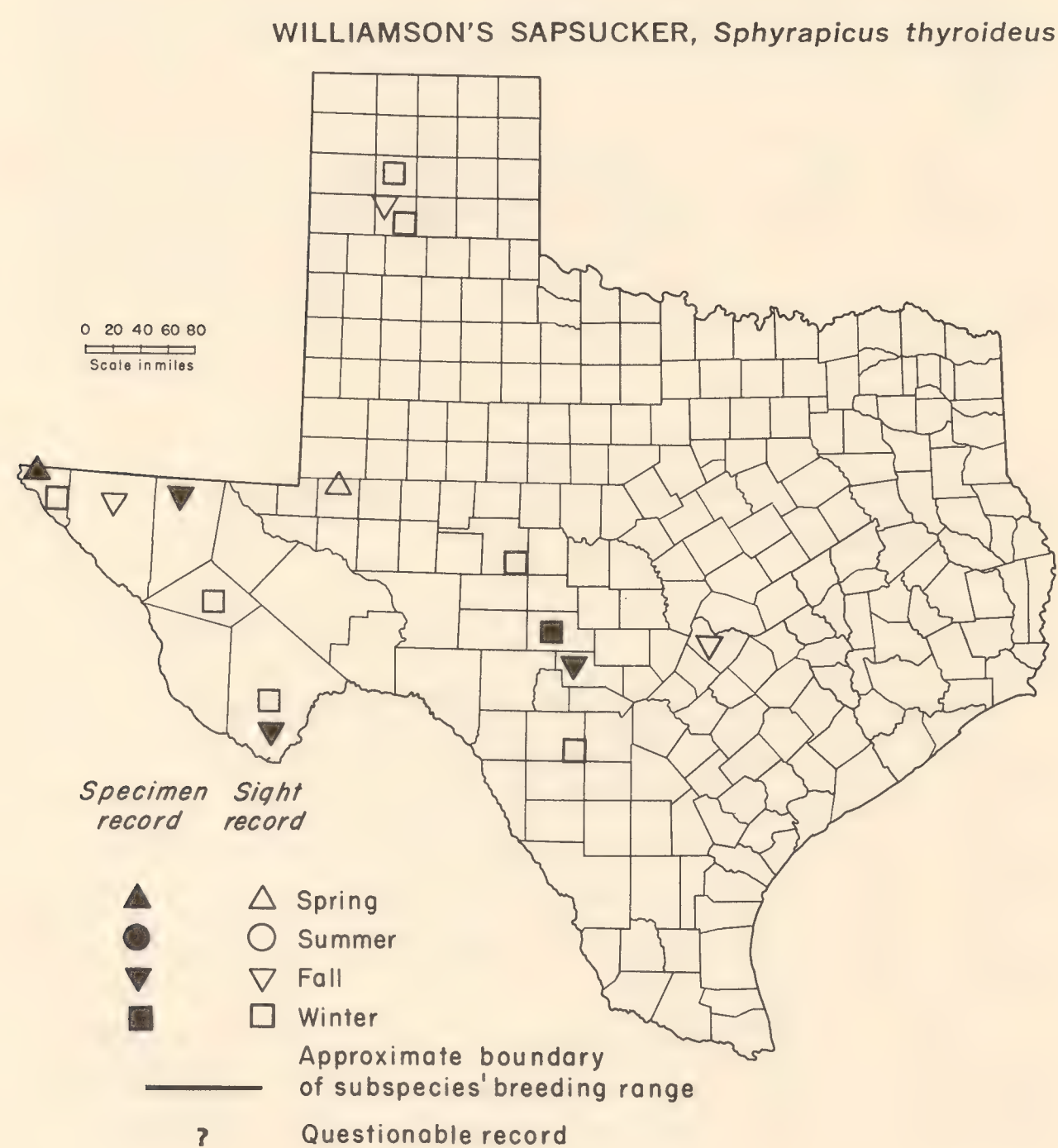
Chief vocalization of the Williamson's Sapsucker is a *cheer* or *que-yeer* (sometimes described as *whee-yeer*) which is suggestive of the cry of the Red-tailed

Hawk. Drumming heard on the breeding grounds is several rapid thumps succeeded by three or four slow, accented ones.

DETAILED ACCOUNT: ONE SUBSPECIES

NATALIE'S WILLIAMSON'S SAPSUCKER, *Sphyrapicus thyroideus nataliae* (Malherbe)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by wear from winter plumage. Upper parts, including inner wing-coverts, glossy metallic greenish black; rump broadly streaked with white; upper tail-coverts white, laterally somewhat mixed with dull black; tail black or brownish black, with slight metallic sheen on outer webs of feathers; wing-quills chaetura black; tertials darker with metallic greenish sheen on outer webs; a few of outer primaries with some small spots of white on outer webs, and all wing-quills, except innermost secondaries and tertials, spotted on inner webs with white except at tips; outer lesser, middle, and greater coverts white, at least on outer webs, forming broad white bar along wing; postocular streak buffy white; nasal tufts yellowish white, adjoining a broad white malar stripe; auricular region, sides of neck, sides of chin, throat, and jugulum glossy metallic greenish black like upper surface; chin scarlet red; sides, flanks, and crissum dull white or buffy white, much barred and streaked with dull black; middle of breast and abdomen sulphur yellow or canary yellow; lining of wing white, barred with chaetura black. Bill in summer black, in winter purplish slate brown; inside of mouth dull pale pink; iris chestnut; legs and feet grayish olive; claws black. *Adult male, winter*: Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial*: Acquired by wear from winter. Pileum and hindneck drab or dark drab, posteriorly more or less streaked with dull black; remainder of upper surface, including wing-coverts, dull black or chaetura black, numerous and rather narrowly barred with white, buffy white, or light drab; upper tail-coverts white, lateral feathers drab with chaetura black or chaetura drab spots or bars; tail dull black or chaetura black, central pair of feathers numerous barred with white except at tips, two outer feathers barred and spotted with dull white or brownish white on terminal portions; wing-quills hair brown or chaetura drab, spotted or barred on outer edges of both webs with white or brownish white; sides of head and chin like pileum, malar region obscurely streaked with black; sides of neck, all of throat, and jugulum dull black, much overlaid with light drab, giving rather barred effect; sides of breast and of body, with flanks and crissum, dull white, buffy white, or very pale drab, broadly and numerous barred with dull black; middle of breast and of abdomen primrose yellow or lemon yellow; lining of wing dull white, numerous and narrowly barred with fuscous or chaetura black. *Adult female, winter*: Acquired by complete postnuptial molt. Similar to nuptial adult female. *Male, first nuptial*: Acquired by wear from first winter. Practically same as nuptial adult male. *Male, first winter*: Acquired by complete postjuvenile molt. Practically identical with adult male in winter. *Female, first nuptial*: Acquired by wear from first winter. Like first nuptial female. *Female, first winter*: Acquired by complete postjuvenile molt. Like adult female in winter. *Male, juvenal*: Acquired by postnatal growth. Similar to adult male, but everywhere much duller; upper parts fuscous black or dull black with very little metallic sheen; pileum and back much spotted with white; tertials and scapulars also spotted with white; anterior lower parts fuscous, middle of chin dull white or brownish white instead of red; sides and flanks fuscous barred with dull white; middle of abdomen and of breast very pale yellow or yellowish white. *Female, juvenal*: Acquired by postnatal growth. Similar to nuptial adult female, but barring of upper surface less sharply defined; anterior lower parts dull drab, barred with fuscous or chaetura black, without broad blackish areas on feathers of adult; sides, flanks, and crissum paler and duller, dark bars narrower and fuscous instead of black; center of breast and of abdomen pale buff or yellowish white instead of bright yellow.



MEASUREMENTS: *Adult male*: Wing, 131.5–138.9 (average, 135.6) mm.; tail, 78.5–88.4 (84.1); bill (exposed culmen), 23.1–25.9 (24.1); tarsus, 20.6–21.6 (21.1); middle (outer anterior) toe without claw, 14.0–15.0 (14.2). *Adult female*: Wing, 133.1–138.9 (135.6); tail, 78.0–87.6 (83.8); bill, 21.6–24.4 (22.9); tarsus, 20.1–22.6 (20.9); middle (outer anterior) toe, 14.0–15.0 (14.7).

RANGE: N. Idaho and n. Montana, south to c. Arizona and c. New Mexico. Winters from c. Arizona and w. Texas to Jalisco.

TEXAS: *Winter*: Taken in El Paso (Apr. 10), Culberson, Brewster (Oct. 18), Kimble, and Kerr (Oct. 24) cos.

HAIRY WOODPECKER, *Dryobates villosus* (Linnaeus)

SPECIES ACCOUNT

Dendrocopos villosus of A.O.U. check-list, 1957 (see Appendix A). Call is a loud, sharp *peek!* A medium-sized black-and-white woodpecker with a long stout bill. Has broad dorsal white stripe down back; pied head pattern; white or whitish under parts (brownish from s. Mexico south); numerous white spots on black wings; solid white outer feathers on black tail. Male has small red band on back of head. Length, 8¾ in.; wingspan, 15; weight, 2¼ oz.

RANGE: Alaska, Canada, and most of contiguous United States, south through highlands of Mexico and Central America to w. Panama; also Bahamas. Northern races wander slightly in winter.

TEXAS: (See map.) *Resident*: Breeds, mid-Mar. to late Aug. (eggs, Apr. 13 to 19; young in nest, Apr. 18 to June 25; fledgling as late as Aug. 27) from near sea level to 8,500 ft. Fairly common to uncommon in Guadalupe Mts., in northeastern Panhandle (breeding suspected), and in much of eastern third, west to Gaines-

ville, Fort Worth, and Waco, irregularly south to Bastrop (breeding suspected) and Houston, where scarce. May have formerly (19th century) occurred throughout the year locally on Edwards Plateau, but nesting doubtful. *Vagrant*: Aug. 12 to May 19. Wanders, chiefly during coldest months, south locally into remainder of eastern third, where scarce, and into remainder of Panhandle, where uncommon to scarce; rare south to El Paso, Davis Mts., northern Edwards Plateau, and Weatherford (Parker Co.); casual at Austin (formerly rare) and Rockport.

HAUNTS AND HABITS: The Hairy appears to be a large version of the Downy Woodpecker. In the United States, both species inhabit the same woods, but only the Hairy ranges sierras of Mexico and Central America. In Texas, it seeks secluded timberlands and their fringes, appearing less frequently than the Downy in cultivated areas and near human habitation. This solitary woodpecker is seldom seen except singly or in pairs.

Flight, typical of the family, is swift and undulating, performed with few but powerful wing-beats. The Hairy is strong and steady in its movements as it searches usually in the higher parts of rough-barked trees for its favored wood-boring ants, beetles, and other insects, their larvae and eggs, caterpillars, and spiders; also wild fruit and seeds. Sometimes it darts out after a winged insect from a dead treetop branch.

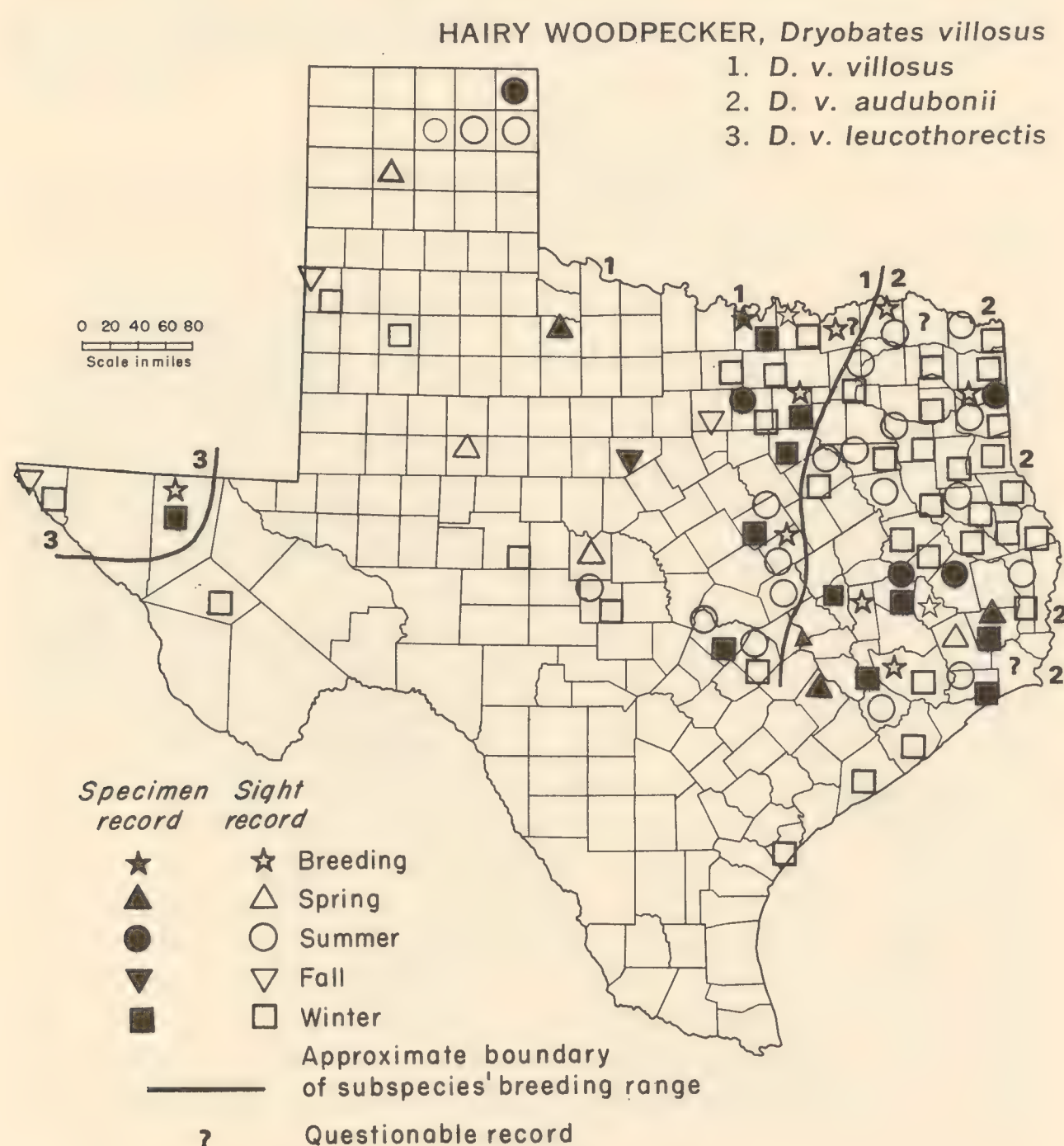
The Hairy Woodpecker's *peek!* note is louder and shriller than the Downy's *pick*. It also utters a rattling call, suggestive of a kingfisher, which is more run together than the comparable Downy rattle. As is to be expected, the Hairy's springtime drumming is a bit louder than that of its small relative.

CHANGES: The Hairy Woodpecker, like other primarily cool temperate nesting birds, has been slowly declining as a breeder in Texas during the twentieth century. Warming and drying of the state's climate from 1900 to 1957, deforestation, and in late years increasing pollution are factors that seem to be involved.

DETAILED ACCOUNT: THREE SUBSPECIES

EASTERN HAIRY WOODPECKER, *Dryobates villosus villosus* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage*: Acquired by partial prenuptial molt. Upper parts rather glossy black; broad superciliary stripe to nape and broad dorsal stripe white; occipital band scarlet; four middle tail feathers black, next pair black except for white tip, remainder mostly white; wing-quills hair brown or chaetura black, spotted on inner and outer webs with white, many of wing-coverts also with large spots of white excepting anterior lesser coverts; lining of wing white, spotted or barred with dull black; nasal tufts brownish white; postocular stripe, malar stripe, and stripe on side of breast, with sides of neck, black; rictal stripe and entire lower surface white. Bill slate, blackish slate, dusky neutral gray, or bluish black; mandible plumbeous or slate gray, but tip dull white and base sometimes paler; bare orbital region greenish slate; iris dark brown, dark red, claret brown, or black; legs and feet greenish slate, blackish slate, slate gray, or plumbeous; claws black or blackish slate. *Adult male, winter*: Acquired by complete postnuptial molt. Identical with nuptial adult male. *Adult female, nuptial*:



Acquired by partial prenuptial molt. Similar to nuptial adult male but without red on occiput. *Adult female, winter*: Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, second winter*: Acquired by complete postnuptial molt. Like corresponding sex of nuptial adult. *Male, first nuptial*: Acquired by wear from first winter. Like nuptial adult male, but red markings on occiput duller and less extensive, white areas not so purely white. *Male, first winter*: Acquired by complete postjuvenile molt. Like first nuptial male. *Female, first nuptial*: Acquired by wear from first winter. Similar to nuptial adult female, but white markings duller and not so purely white. *Female, first winter*: Acquired by complete postjuvenile molt. Like first nuptial female. *Male, juvenal*: Acquired by postnatal growth. Similar to nuptial adult male, but bill smaller and plumage softer, upper parts much duller brownish black or fuscous black, white areas somewhat yellowish, white dorsal stripe somewhat spotted with brownish black; crown usually spotted or streaked at first with flesh ochre to dull rufous, later with yellow, orange, or dull scarlet, sometimes with dots of dull white; innermost white tail feathers usually with black tip; sides and flanks washed and spotted with mouse gray. Bill dull slate color, dark neutral gray, or dusky neutral gray, but mandible sometimes lighter; iris cinnamon, dark sepia, or burnt sienna; legs and feet cinereous. *Female, juvenal*: Acquired by postnatal growth. Similar to juvenal male, but usually without any orange or pale red on crown, although crown is sometimes finely streaked or spotted with dull white. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 118.1–124.0 (average, 120.9) mm.; tail, 65.0–77.0 (71.7); bill (exposed culmen), 26.9–33.0 (29.2); tarsus, 21.1–23.1 (22.1); middle (outer anterior) toe without claw, 13.0–15.5 (14.5). *Adult female*: Wing, 115.1–121.4 (118.6); tail, 69.1–78.5 (73.4); bill, 24.9–29.9 (26.9); tarsus, 20.1–22.6 (21.1); middle (outer anterior) toe, 13.0–14.5 (14.0).

RANGE: North Dakota to Nova Scotia, south to n. Texas and s.w. South Carolina.

TEXAS: *Resident*: Altitudinal breeding range, 400 to 2,500 ft. Collected northwest to Lipscomb, east to Cooke and Dallas, south to McLennan cos. Uncommon.

NESTING: *Nest*: On uplands or lowlands, swampy or dry; in swamps, dense forests, preferably deciduous, open woods, or edges of woodlands, less frequently orchards or other cultivated areas; in hole made by the birds in dead or living tree, deciduous or coniferous, sometimes more than 50 ft. above ground; material, a few chips in cavity. *Eggs*: 3–6, usually 4; ovate to elliptical oval or rounded ovate; glossy; pure white, unspotted; average size, 23.6 × 18.0 mm.

SOUTHERN HAIRY WOODPECKER, *Dryobates villosus audubonii* (Swainson)

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *D. v. villosus* but smaller; white spots on upper wing-coverts smaller and less numerous; white of lower parts duller and more brownish.

MEASUREMENTS: *Adult male*: Wing, 110.5–117.6 (average, 113.8) mm.; tail, 57.9–69.1 (65.3); bill (exposed culmen), 26.4–30.5 (28.2); tarsus, 19.6–21.6 (20.9); middle (outer anterior) toe without claw, 13.0–14.5 (13.7). *Adult female*: Wing, 108.5–115.6 (112.3); tail, 58.9–70.1 (64.8); bill, 24.9–27.4 (25.9); tarsus, 19.0–20.6 (20.1); middle (outer anterior) toe, 12.4–14.0 (13.0).

RANGE: S.e. Missouri to s.e. Virginia, south to s.e. Texas and e. Florida.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 800 ft. Collected north to Marion, south to Chambers, west to Lee and Brazos cos. Fairly common. *Vagrant*: Two specimens: Cooke Co., Gainesville (Jan. 4, 1887, G. H. Ragsdale); Travis Co., Austin (Jan. 4, 1904, A. E. Schutze).

NESTING: Similar to that of *D. v. villosus*, but nest often placed in baldcypress tree on edge of swamp or in oak timber on uplands; average egg size, 21.4 × 18.3 mm.

WHITE-BREASTED HAIRY WOODPECKER, *Dryobates villosus leucothorectis* Oberholser

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *D. v. villosus* but larger, particularly wing, tail, and bill; upper wing-coverts without white spots, except occasionally a few very small dots.

MEASUREMENTS: *Adult male*: Wing, 123.5–131.0 (average, 126.2) mm.; tail, 75.4–86.6 (79.2); bill (exposed culmen), 28.4–33.0 (30.7); tarsus, 20.1–22.6 (21.6); middle (outer anterior) toe without claw, 12.4–15.5 (13.7). *Adult female*: Wing, 120.4–128.0 (123.7); tail, 72.9–83.1 (77.7); bill, 23.9–27.4 (25.7); tarsus, 20.1–22.1 (20.9); middle (outer anterior) toe, 13.0–14.5 (13.5).

RANGE: S.w. Utah and n. New Mexico, south to w. Arizona and n. Trans-Pecos Texas.

TEXAS: *Resident*: Altitudinal breeding range, 5,000 to 8,500 ft. Collected in Guadalupe Mts., Culberson Co. Fairly common.

NESTING: Similar to that of *D. v. villosus*, but average egg size, 24.4 × 18.0 mm.

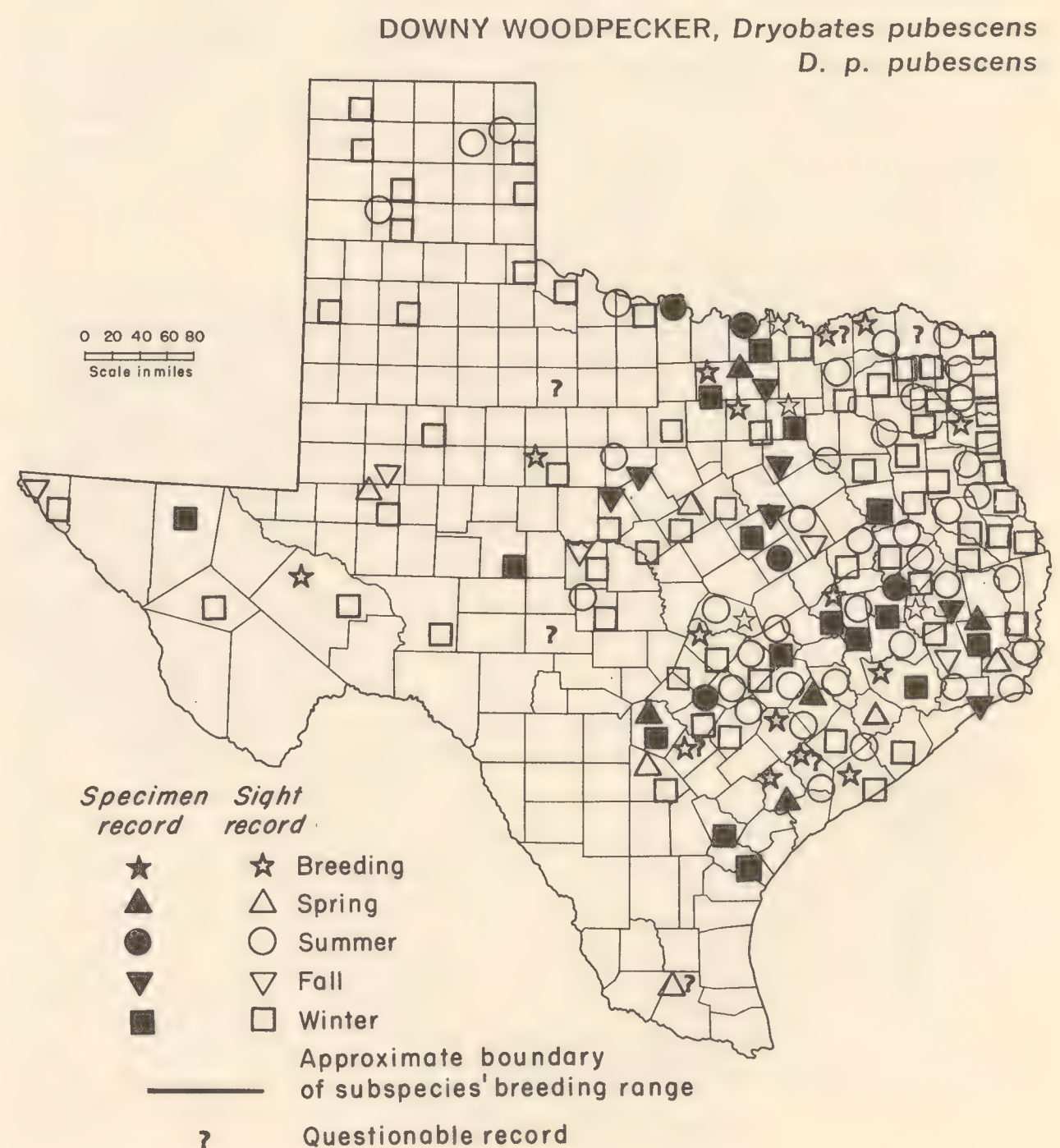
DOWNY WOODPECKER, *Dryobates pubescens* (Linnaeus)

SPECIES ACCOUNT

Dendrocopos pubescens of A.O.U. check-list, 1957 (see Appendix A). Call is a low, flat *pick*. Closely resembles the larger Hairy, but its short, slender bill is much shorter and smaller; white outer tail feathers are almost always barred or spotted with black. Length, 6½ in.; wingspan, 11¾; weight, 1 oz.

RANGE: S.e. Alaska, Canada, and contiguous United States (absent from parts of Southwest, where it may appear locally in winter).

TEXAS: (See map.) *Resident*: Breeds, late Mar. to late June (eggs, May 4 to May 28; young nearly fledged, Apr. 11, 20) from near sea level to about 2,000



ft. Common to fairly common in central and eastern portions, west to northern Panhandle (local), Abilene, and Austin, south to Palmetto State Park, Victoria, and upper coast. Casual nester in Pecos Co., at Sheffield (eggs discovered, May 4, 5, 1912, J. S. Ligon). May have formerly (19th century) bred locally on eastern Edwards Plateau and in Wilson Co. *Vagrant*: Scarce to rare, chiefly during winter, in middle and southern Panhandle, Trans-Pecos (north of 30th parallel), and from northern and eastern Edwards Plateau south to central coast. Unconfirmed sighting in Hidalgo Co.

HAUNTS AND HABITS: Usual little woodpecker of humid U.S. woodlands is the Downy; it is one of the very few stateside birds not also found in Mexico. In east Texas, the species frequents wooded and bushy stream-sides, edges of clearings, trees bordering cultivated areas, and—being less retiring than the Hairy Woodpecker—the vicinity of human dwellings. It is not gregarious, but frequently in winter feeds in loose gatherings with other small woodland birds, such as Carolina Chickadee, Tufted Titmouse, nuthatches, Brown Creeper, and kinglets.

Downy Woodpecker flight is swift, strong, and can be long sustained, but ordinarily the bird negotiates only short, undulating flights from tree to tree. Exhibiting its woodpecker agility, it maneuvers skillfully on tree trunks, limbs, and even small branches. Generally in bushes or lower parts of trees, it searches for wood-inhabiting insects, their larvae and eggs, caterpillars, weevils, insect scales, locusts, grasshoppers, and an occasional spider; also wild fruits and seeds.

Note of the Downy Woodpecker is a flat *pick*, uttered frequently as the bird feeds. Another vocalization is a series of notes descending in pitch, which is rapidly uttered but not as slurred as is the similar call of the Ladderback. The male's springtime drumming consists of the lightest woodpecker taps that are heard in eastern Texas.

DETAILED ACCOUNT: THREE SUBSPECIES

SOUTHERN DOWNY WOODPECKER, *Dryobates pubescens pubescens* (Linnaeus)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts black; nasal tufts yellowish white; a superciliary and a malar stripe, with broad dorsal stripe, white; occipital band scarlet red; four middle tail feathers black, second pair terminally white on outer webs; remaining tail feathers mostly white, barred terminally with dull black or fuscous black; wing-quills fuscous or chaetura black, spotted on both webs with white; wing-coverts black, except anterior lesser coverts, with many large spots of white; lower parts brownish white or pale smoky brown, chin and crissum palest; lining of wing white, outer edge partly dull black. Bill dusky neutral gray, plumbeous, black, blackish slate, slate color, or slate black, but base of mandible cinereous or french gray; iris dark claret brown or walnut brown; legs and feet plumbeous, dark plumbeous, black, slate color, or storm gray; claws slate gray, mouse gray, or greenish slate. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male, but white areas slightly yellowish. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but without red on back of head, this replaced by more or less broken white band, which is usually divided by black on middle

portion. *Adult female, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult female, but white portions of plumage with slight yellowish wash. *Male, first nuptial:* Acquired by wear from first winter. Like nuptial adult male. *Male, first winter:* Acquired by complete postjuvenile molt. Like first nuptial male, but white areas not so clearly white. Practically identical with adult male in winter. *Female, first nuptial:* Acquired by wear from first winter. Similar to nuptial adult female. *Female, first winter:* Acquired by complete postjuvenile molt. Practically like nuptial adult female. *Male, juvenal:* Acquired by postnatal growth. Similar to nuptial adult male, but all white areas tinged with yellow; black of upper surface duller and more brownish; white median stripe down back duller, slightly buffy, and a little mixed with black; red occipital band absent; top of head more or less marked, at first with flesh ochre to dull rufous, yellow, or pink, later with scarlet, and crown sometimes dotted with white; lower surface duller, more brownish or buffy than in nuptial adults; sides and flanks obscurely spotted or with short streaks of mouse gray, fuscous, or fuscous black; throat sometimes obscurely streaked, spotted, or even barred with mouse gray. Bill dark slate color or dusky neutral gray, but base of mandible sometimes lighter; iris claret brown or dark sepia; legs and feet light slate color or greenish slate color. *Female, juvenal:* Acquired by postnatal growth. Similar to juvenal male, but usually without red or yellow on pileum. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 86.1–90.9 (average, 88.6) mm.; tail, 48.0–53.1 (50.5); bill (exposed culmen), 15.0–16.5 (15.7); tarsus, 15.0–16.5 (15.7); middle (outer anterior) toe without claw, 9.4–10.9 (10.4). *Adult female:* Wing, 86.6–90.9 (88.6); tail, 48.0–54.6 (51.8); bill, 14.0–16.5 (15.2); tarsus, 14.5–16.5 (15.7); middle (outer anterior) toe, 9.4–10.9 (10.2).

RANGE: S.e. Kansas to s.e. Virginia, south to c. Texas and s. Florida.

TEXAS: *Resident:* Collected north to Clay and Cooke, east to Hardin and Chambers, south to Victoria, west to Guadalupe and Eastland cos.; formerly (19th century) south to Bee, west to Bexar and Tom Green cos. Common.

NESTING: *Nest:* On hills or lowlands; in open woodlands, sometimes heavy forests, swamps, open country, orchards, and other cultivated lands; in hole in tree made by the birds, in dead or living wood, with round or oval entrance; a few chips of wood for nest material. *Eggs:* 3–6, usually 4–5; ovate or rounded ovate; glossy or not; white, unmarked; average size, 19.6 × 15.2 mm.

NORTHERN DOWNY WOODPECKER, *Dryobates pubescens medianus* (Swainson)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *D. p. pubescens* but larger; lower parts paler, more nearly white (tinged with less brown).

MEASUREMENTS: *Adult male:* Wing, 90.9–96.0 (average, 94.2) mm.; tail, 51.1–60.5 (55.6); bill (exposed culmen), 15.0–17.5 (16.3); tarsus, 15.0–16.5 (16.0); middle (outer anterior) toe without claw, 9.9–10.9 (10.4). *Adult female:* Wing, 91.4–97.1 (94.7); tail, 50.5–61.5 (56.1); bill, 14.5–17.5 (15.5); tarsus, 15.0–16.5 (15.5); middle (outer anterior) toe, 9.4–10.9 (10.2).

RANGE: S. Alberta to Nova Scotia, south to n.w. Oklahoma and n.w. South Carolina; casual, chiefly in winter, to Texas.

TEXAS: *Winter:* Two specimens: Cooke Co., Gainesville (Mar. 21, 1888, G. H. Ragsdale); San Patricio Co., Welder Wildlife Refuge (female, late Feb., 1959, C. Cottam; Welder collection, no. 471).

BATCHELDER'S DOWNY WOODPECKER, *Dryobates pubescens leucurus* (Hartlaub)

DESCRIPTION: *Adult male and female, nuptial plumage:* Similar to *D. p. medianus* but larger, with less or no white on upper

wing-coverts, spots being small and few; lower surface more purely white.

MEASUREMENTS: *Adult male:* Wing, 94.5–103.6 (average, 99.3) mm.; tail, 57.9–68.1 (62.2); bill (exposed culmen), 16.0–18.0 (17.3); tarsus, 15.5–17.0 (16.5); middle (outer anterior) toe without claw, 9.9–10.9 (10.4). *Adult female:* Wing, 95.0–105.4 (100.8); tail, 61.0–66.5 (63.8); bill, 15.5–18.0 (16.8); tarsus, 15.5–17.0 (16.3); middle (outer anterior) toe, 9.4–10.9 (10.2).

RANGE: S. British Columbia and s.w. Alberta, south to s. California and c. New Mexico; casual, chiefly in winter, to n. Trans-Pecos Texas.

TEXAS: *Winter:* Two specimens: Culberson Co., Guadalupe Mts., The Bowl (Jan. 1, 1939, T. D. Burleigh; same date, G. H. Lowery, Jr.).

LADDER-BACKED WOODPECKER, *Dryobates scalaris* (Wagler)

SPECIES ACCOUNT

Dendrocopos scalaris of A.O.U. check-list, 1957 (see Appendix A). A small “zebra-backed” (“ladder-backed”) woodpecker with black-and-white facial stripings; whitish below with fine blackish spots on sides, blackish bars on flanks and crissum. Male has red cap; female’s is black. Length, 7¼ in.; wingspan, 13; weight, 1¼ oz.

RANGE: S.e. California, s. Nevada, s.w. Utah, s.e. Colorado, and w. Oklahoma, south through Mexico to Honduras (Pacific coast), Chiapas, and British Honduras.

TEXAS: (See map.) *Resident:* Breeds, mid-Mar. to late July (eggs, Apr. 1 to July 9) from near sea level to 7,500 ft. Common to fairly common in western two-thirds east to Fort Worth, Waco, Austin, Gonzales, and

central coast; uncommon to scarce east to Sherman, Dallas, Mexia (Limestone Co.), College Station, and Bay City. *Vagrant:* Casual sightings in Smith (no details), Montgomery, Harris, and Galveston cos.

HAUNTS AND HABITS: The Ladderback is the standard small woodpecker of mesquite and cactus lands of the Southwest. In Texas, it seeks brush-lined streams and scrubby flats, hills, mesas, and canyons; it is also observed along fence rows, in cultivated areas—particularly those adjacent to thickets or woods. *Dryobates scalaris* is a solitary species, although two or three are sometimes seen together.

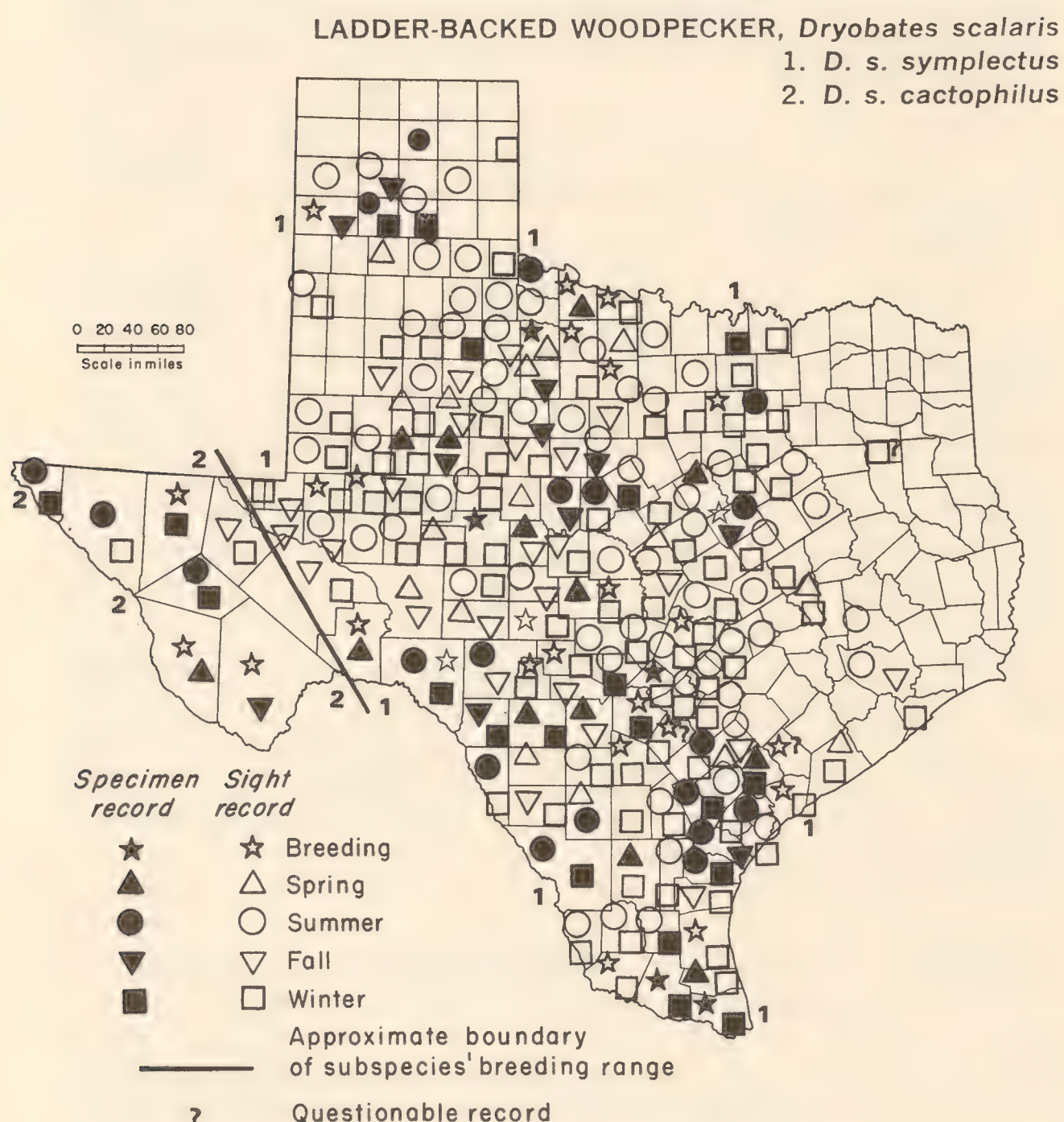
Behavior of this woodpecker is much like that of the Downy. Flight is swift and undulating, but seldom sustained. The Ladderback spends much of its time in the lower parts of small trees and brush where it gleans wood-boring insects, their larvae and eggs, weevils, ants, and caterpillars; also the fruits (tunas) of various kinds of cactus.

The Ladder-backed Woodpecker’s *pick* note is similar to that of the Downy but louder. Usual call is a series of rattling notes—more run together than is the Downy’s—which descends in pitch. The male’s spring-time drumming is lighter than that of the Goldenfront, the only other woodpecker which commonly breeds in the brush country of south Texas.

DETAILED ACCOUNT: TWO SUBSPECIES

TEXAS LADDER-BACKED WOODPECKER, *Dryobates scalaris symplectus* Oberholser

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Crown and nape black, feathers of former subterminally dotted with white and tipped with scarlet vermillion which merges into solid band of red on occiput and anterior hindneck; rest of upper surface black and, except on longer upper tail-coverts, broadly barred with white, this white broader than the black interspaces; tail black, three outer pairs of rectrices, including dwarfed outermost, barred throughout with white, fourth pair barred terminally on inner vane, and for terminal half of outer vane with white; wing-quills fuscous or fuscous black, spotted with white on edges of outer and inner webs; wing-coverts black, profusely spotted with white; sides of head brownish white; stripe above ear-coverts and malar stripe black; nasal tufts buffy brown; lower surface brownish white or very pale buffy brown; chin and crissum mostly dull white; sides of breast and of body spotted, flanks and crissum barred, with fuscous black; lining of wing brownish white, spotted with fuscous or dull black. Bill dull black or dark brownish gray, paler on mandible; iris brown or red; legs and feet dull grayish olive green. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but pileum without red, this portion unmarked brownish black, becoming fuscous on forehead. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male and female, first nuptial:* Acquired by wear from first winter. Like corresponding sex of nuptial adult. *Male and female, first winter:* Acquired by complete postjuvenile molt. Like corresponding sex of first nuptial. *Male, juvenal:* Acquired by postnatal growth. Similar to adult male, but red of head confined to center of crown and finely spotted with white; all white parts of plumage duller, more grayish; occiput and hindneck uniform fuscous or fuscous black; upper parts duller, black bars more brownish and less sharply defined; lower surface more buffy, black markings duller, sides of breast more streaked and spotted, and these markings not so clearly defined. *Female, juvenal:* Ac-





Ladder-backed Woodpecker, *Dryobates scalaris*

quired by postnatal growth. Similar to juvenal male, but top of head with less red. *Natal*: None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 98.1–106.9 (average, 102.4) mm.; tail, 53.6–60.5 (57.2); bill (exposed culmen), 20.1–23.9 (22.4); tarsus, 16.0–18.5 (17.8); middle (outer anterior) toe without claw, 11.9–13.5 (12.7). *Adult female*: Wing, 96.5–104.9 (100.1); tail, 52.6–60.5 (56.6); bill, 18.0–21.1 (20.1); tarsus, 16.5–18.5 (17.3); middle (outer anterior) toe, 10.9–13.0 (12.2).

RANGE: S.e. Colorado, south to n.e. Coahuila and s. Tamaulipas.

TEXAS: *Resident*: Altitudinal breeding range, near sea level to 4,000 ft. Collected north to Deaf Smith and Hutchinson, east to Dallas, south to Victoria and Cameron, west to Terrell cos. Locally common.

NESTING: *Nest*: On bottomlands as well as mesas and lower slopes of mountains, often along streams or lakes; in brush, low open woods, or open country; in tree, stem of yucca, agave bloom stalk, telephone pole, or post, usually only a few feet above ground; in hole made by the birds in living or dead wood; a few chips of wood for nest material. *Eggs*: 2–7, usually 3–5; oval to elliptical oval or elliptical ovate; glossy; white, unmarked; average size, 20.9 × 16.0 mm.

CACTUS LADDER-BACKED WOODPECKER, *Dryobates scalaris cactophilus* Oberholser

DESCRIPTION: *Adult male and female, nuptial plumage*: Similar to *D. s. symplectus*, but male larger; upper parts darker, white bars narrower, black bars broader and with less white on pileum; sides of breast less often spotted, mostly streaked.

MEASUREMENTS: *Adult male*: Wing, 102.1–109.0 (average, 105.1) mm.; tail, 57.4–68.1 (61.7); bill (exposed culmen), 21.6–24.4 (23.4); tarsus, 18.0–19.6 (18.8); middle (outer anterior) toe without claw, 12.4–14.0 (13.2). *Adult female*: Wing, 97.1–104.6 (100.8); tail, 55.9–63.5 (59.7); bill, 17.5–22.1 (19.8); tarsus, 16.0–18.5 (17.3); middle (outer anterior) toe, 11.4–13.0 (12.2).

RANGE: S.e. California to n. New Mexico, south to n.w. Durango and n. Coahuila.

TEXAS: *Resident*: Altitudinal breeding range, 1,800 to 7,500 ft. Collected in El Paso, Hudspeth, Culberson, Jeff Davis, Presidio, and Brewster cos. Locally common.

NESTING: Similar to that of *D. s. symplectus*, but average egg size, 21.9 × 15.7 mm.

RED-COCKADED WOODPECKER, *Phrenopicus borealis* (Vieillot)

SPECIES ACCOUNT

Dendrocopos borealis of A.O.U. check-list, 1957 (see Appendix A). A "zebra-backed" woodpecker with a solid black cap and nape and a prominent white cheek-patch (uninterrupted by black); white below with black spots on sides, black bars on crissum. Male has a tiny red streak behind eye near ear (the cockade), which is usually not visible in the field. Length, 8¼ in.; wingspan, 14½; weight, 1½ oz.

RANGE: E. Oklahoma to s. Maryland and s.e. Virginia, south to s.e. Texas, Gulf coast, and s. Florida.

TEXAS: (See map.) *Resident*: Breeds, late Mar. to early July (eggs, Apr. 3 to May 25; young in nest, May 30) from near sea level to 550 ft. Rare and local in extensive pine stands of eastern quarter. Formerly west to Lee Co., Giddings (eggs collected, Apr. 4, 1883, J. A. Singley) and Lavaca Co., Hallettsville (eggs collected,

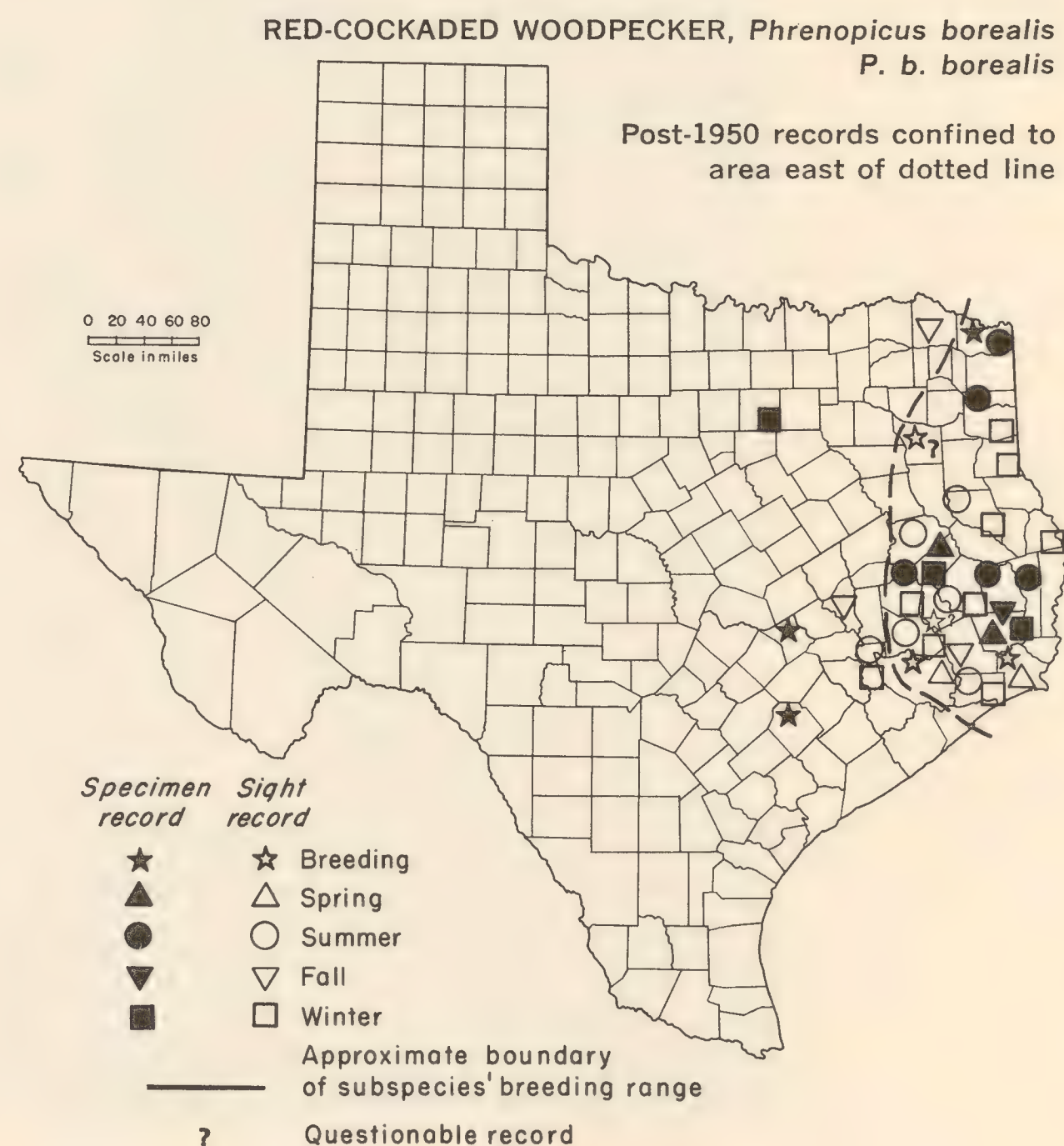
Apr. 3, 1912, E. F. Pope). Accidental at Fort Worth (see detailed account).

HAUNTS AND HABITS: Four species—the Red-cockaded Woodpecker, Brown-headed Nuthatch, Pine Warbler, and Bachman's Sparrow—are endemic (or nearly so) to the pine forests of the southeastern United States. Of these, only the woodpecker is restricted to the Old South; within this area it is exceedingly exacting in its habitat requirements.

For its nesting or roosting hole the Red-cockaded requires large, living pines—usually eighty years old or more—with centers rotted by red-heart fungus disease. The bird pecks away the bark around the hole's entrance so that glistening pine pitch slowly drips like wax from a guttering candle. Perhaps the sticky resin offers some protection against squirrels, snakes, and other predators; certain it is, however, that the strangely decorated holes are the most conspicuous sign of the presence of this unobtrusive woodpecker. The bird usually abandons a hole when the diseased tree dies and fresh pitch stops oozing.

Even in feeding, the bird is severely specialized. It prefers to forage on trunks and upper limbs of large shortleaf pines (*Pinus echinata*); only occasionally does it work other large pines. Here the bird chips away bark to get at larvae of wood-boring insects, beetles, grubs, ants, crickets, and caterpillars. Surprisingly for such a pine-oriented species, the Red-cockaded is said to fly into corn fields to extract worms from roasting ears.

Red-cockaded Woodpecker vocalizations and drumming are not loud. A rasping *sripp* and a high-pitched *tsick* have been described. The bird is most vocal in spring and summer, but family parties converse considerably in fall.



CHANGES: Any bird as overspecialized as the Red-cockaded Woodpecker is predisposed to extinction. Modern forest management calls for harvesting pines before they are old enough to be used by the species for nesting, roosting, and feeding. Studies by D. W. Lay, Texas Parks and Wildlife biologist, indicate that Red-cockaded Woodpeckers once inhabited forty Texas counties, but by 1968 the species was living in only nine—possibly eleven. As of 1969, aside from a few state parks, virtually all timber inhabited by this woodpecker was subject to more or less immediate cutting; however, the Alabama-Coushatta Indians seem to be in no hurry to cut the splendid Red-cockaded nesting pines on their reservation in Polk County.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN RED-COCKADED WOODPECKER, *Phrenopicus borealis borealis* (Vieillot)

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper parts black with slight glossy greenish tinge on pileum; back and scapulars barred with white; four middle tail feathers black, next pair of tail feathers mostly black, but white on terminal portion of outer web; remainder of rectrices mostly white with some dull black at bases, chiefly on terminal portion of inner webs; wing-quills chaetura black, spotted on outer webs and on edges of inner webs with white, these spots on outer webs mostly in form of bars; wing-coverts black with a few spots of white; nasal tufts dull white; stripe over and behind eye and auricular region, extending as far as anterior part of nape, white; separating these white areas is a very narrow black postocular streak; posterior to eye is a short tuftlike streak of metallic red feathers; lores and malar stripe black; lower parts dull white, sides of breast and of body streaked or spotted with dull black, crissum barred or with shaft streaks of fuscous black; lining of wing white, mottled with dull black, particularly on outer portion. Bill blackish slate or dull black; iris hazel or dark brown; legs and feet dull grayish olive. *Adult male, winter:* Acquired by complete postnuptial molt. Similar to nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Like nuptial adult male, but lacking red streak on each side of occiput. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial:* Acquired by wear from first winter. Like nuptial adult, except for lack of red streak on each side of occiput. *Female, first nuptial:* Acquired by wear from first winter. Like nuptial adult female. *Male and female, first winter:* Acquired by complete postjuvenile molt. Similar to corresponding sex of first nuptial. *Male, juvenal:* Acquired by postnatal growth. Similar to adult male, but upper parts duller and more brownish; back and wings fuscous instead of black; feathers of center of crown tipped with dull scarlet; side of occiput without red tuft; dark markings of lower surface duller and more brownish. *Female, juvenal:* Acquired by postnatal growth. Similar to juvenile male, but with little or no red on center of crown, birds with red on crown being probably very young. *Natal:* None. Bird hatched unfeathered.

MEASUREMENTS: *Adult male:* Wing, 112.0–126.0 (average, 119.6) mm.; tail, 70.6–81.0 (75.4); bill (exposed culmen), 20.1–23.1 (21.4); tarsus, 19.0–21.1 (20.3); middle (outer anterior) toe without claw, 12.4–14.5 (13.7). *Adult female:* Wing, 114.0–126.0 (118.9); tail, 71.9–82.0 (75.4); bill, 19.0–22.1 (20.3); tarsus, 19.0–21.1 (19.8); middle (outer anterior) toe, 12.4–14.0 (13.2).

RANGE: E. Oklahoma to s. Maryland and s.e. Virginia, south to s.e. Texas and n. Florida.

TEXAS: *Resident:* Collected north to Bowie, south to Jasper, west to Walker; formerly (pre-1950), west to Lavaca (eggs) and Lee (eggs) cos. (see species account). One specimen out-

side normal range: Tarrant Co., Clear Fork of Trinity River 3 mi. south of Fort Worth (Jan. 30, 1914, G. M. Sutton).

NESTING: *Nest:* Usually on level or rolling lands, hills, or lowlands; in pine woods; in hole made by the bird in living pine with rotten center, usually rather high, sometimes more than 80 ft. above ground; lining a few chips at bottom of cavity. *Eggs:* 2–6, usually 3–4; elliptical ovate; glossy; white, unmarked; average size, 24.1 × 17.5 mm.

IVORY-BILLED WOODPECKER, *Campephilus principalis* (Linnaeus)

SPECIES ACCOUNT

A raven-sized black woodpecker with huge ivory-colored bill; yellow eyes; pointed crest (mostly scarlet in male, entirely black in female). A white stripe begins on each cheek and extends down side of neck until the two stripes more or less come together on mid-back. In flight, both surfaces of flight feathers (except outermost primaries) white. When clinging to a tree trunk, bird appears to have a large white saddle on lower back, caused by junction of white patch on each folded wing. Usual calls: high-pitched nasal yaps—*kent, kent-kent, kent*. (The crow-sized black Pileated Woodpecker has black flight feathers, but white wing-linings; shows no white saddle when perched; cackles a loud chickenlike *kuk-kuk-kukkuk*.) Length, 19–20 in.; wingspan, 31–33; weight, 20 oz. (fide Mark Catesby, 1731), 1 lb. (male specimen, Museum of Comparative Zoology, no. 35888).

RANGE: *Extinct?* Formerly s.e. United States from s.e. Oklahoma, n.e. Arkansas, s.e. Missouri, s.e. Illinois, and s.e. North Carolina, south through e. Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, and South Carolina; also Cuba (race, *bairdi*). Only recent (post-1945) reports and rumors have been from e. Texas, Louisiana, Florida, South Carolina, and Cuba (confirmed by photograph, see John Dennis, 1948, *Auk* 65: 497–506).

TEXAS: Last specimens were two males taken in Liberty Co., 6 mi. east of Tarkington (Nov. 26, 1904, Vernon Bailey, U.S. Biological Survey naturalist). *Resident:* Two specific records of nesting (see detailed account). Formerly locally fairly common in forested eastern portion eastward from the lower Brazos River Valley, becoming increasingly rare after 1850.

HAUNTS AND HABITS: The U.S. and Cuban Ivorybills are closely related to the Imperial Woodpecker, *Campephilus imperialis*, of Mexico; the latter bird, twenty-two inches long, has often been cited as the largest woodpecker in the world. All are attached to virgin forests with plenty of overmature, dying, and dead trees. The two Latin American birds prefer big pines in mountains. *C. principalis* inhabits—if yet it does—chiefly lowland deciduous timber, commonly sweetgum (*Liquidambar styraciflua*), various oaks (*Quercus*), ash (*Fraxinus*), and hackberry (*Celtis laevigata*). All three forms of *Campephilus* are so nearly extinct that hereafter they are referred to in the past tense.

Once the largest of its family found in the United

States, the Ivorybill in Texas inhabited almost exclusively the densely wooded bottomlands and swamps bordering rivers. Only occasionally did it occur in the adjoining upland pine or deciduous forests. A retiring, solitary, and extremely wary bird, it was difficult to observe, and seldom were more than two or three seen together. Courting birds, when separated in the forest, exchanged call notes; together, one would take hold of the other's bill in a seemingly affectionate manner. Apparently, a pair often stayed together after the breeding season and perhaps remained mated for more than one year. In tree trunks birds dug roost holes (usually different from nest holes) which they used night after night; each bird habitually slept alone.

Ordinary foraging flights were not protracted and often consisted of a single bounding swoop from one tree to another, generally in the higher parts of the trees. At other times, however, the Ivorybill performed long flights to far parts of the forest, particularly when leaving the nest or when alarmed. Such protracted flights were not usually undulating, but straightaway. When flying thus it bore a surprising resemblance to a Pintail duck. At times it descended to lower parts of a tree and even to the ground or a prostrate log, where it hopped about like other woodpeckers. On trees and stumps it whacked and chiseled for food, mainly larvae of beetles ("borers") that live between bark and sapwood, also some adult beetles and ants. It also ate, chiefly in fall and winter, magnolia seeds, pecans, hickory nuts, acorns, hackberries, and wild grapes.

To expose insects, it would tear off bark of a dead tree trunk, sometimes completely to the ground; or it would riddle, and often nearly demolish, a dead or decayed stub. The power of its bill was evidenced from the large chips that it whacked from trees, many of which were seven or eight inches long. In order to make a particularly hard stroke, it firmly pressed the stiff points of its tail against the trunk, leaned back to the full extent of its legs, and then put all its body weight behind the force of the forward stroke of its bill.

The call of the Ivorybill was a high-pitched, nasal note—remarkably weak for such a large bird. It has been represented variously as *pait*, *hank*, *kent*, or *kant*, the last two seeming to be the best renditions. This was several times repeated and was very suggestive of a magnified version of the ordinary note of the White-breasted Nuthatch. It could be heard under favorable conditions a quarter of a mile. Apparently this was not uttered on the wing, or at least very rarely. At certain times of the year, especially during the early breeding season, this woodpecker sometimes drummed with its bill on a dead limb or stub of resonant wood. The first part consisted of a few measured taps, followed by a rapid succession of beats, in which the bird made approximately twenty-eight strokes per second. In the presence of intruders or when mates were separated, either sex frequently tapped a series of double raps.

CHANGES: The first mention of the Ivory-billed Woodpecker in Texas seems to have been by the great Amer-

ican woodsman himself, John James Audubon. In 1837, he pronounced these birds "abundant" in what is now Harris and Fort Bend counties. Discovery and beginnings of decline coincided. However, decrease was concealed by the Ivorybill's similarity to the big Pileated Woodpecker, and even to the middle-sized Red-headed Woodpecker; the Redhead's white dorsal saddle and its comparatively straightaway flight resemble in miniature those of the Ivorybill. Reports of occurrence based on mistaken identity started early; thus, what was probably a Pileated at New Braunfels, Comal County, was stated to be an Ivorybill (F. Roemer, 1849, *Texas*, p. 461).

In the Ivorybill's waning years—which came just before the invention of good binoculars, high-speed film, and telephoto lenses—it apparently was sometimes necessary to shoot birds to determine their identity and food habits. Vernon Bailey, field naturalist with the U.S. Biological Survey (forerunner of the U.S. Fish and Wildlife Service) described his experience in collecting the last two Texas specimens, which were two of the only three Ivorybill stomachs ever scientifically examined for food contents. During his sojourn of November 21 to December 8, 1904, in the east Texas Big Thicket region (Liberty and Hardin cos.), Bailey wrote:

"The Ivory-billed Woodpecker is well known to all the residents throughout the Big Thicket, and was reported as fairly common at every place where we inquired. Even the boys could imitate its harsh notes. Still the only birds we saw were between Tarkington Prairie and the Trinity River, where I saw six in one day—November 26, 1904. Two of these I secured, but the others were so wild that I got only a long distance shot at one flying above the pine tops. The first two birds seen were calling and drumming near the tops of tall dead pines about six miles east of Tarkington Post Office in one of the many patches of pines killed by boring larvae. I recognized the birds by a voice I had never heard before but was sure could be nothing else—a loud *hank, hank, hank*, in high, harsh, nasal tones, interspersed with slow, heavy tapping on the dry wood. Following it up I located one of the birds, and while slipping up for a shot I watched its spirited motions as it sprang from place to place on the trunk, leaning well back or swinging the long neck for a stroke. The white wing-patches, white neck-stripe, and erect scarlet crest are far more striking than in the Pileated Woodpecker, and the manners and motions of the bird are more spirited. When I shot the male the female at once flew away, but I could not reach her with the other barrel of my gun as she flew over the tops of the trees, and she did not stop within sight or hearing. A few miles farther on I heard another in the woods, and following up its voice got a glimpse of it as it flew away through the woods.

"That evening we camped at the south of Gaylor Lake [Liberty Co.] on the Trinity River bottoms and just at sundown I heard the then familiar call of the Ivorybills. Hurrying through the woods I found three

of these spirited birds near the top of a tall dead trunk of a cow oak [*Quercus prinus*], swinging their heads backward and forward, springing higher or dropping lower on the trunk, occasionally tapping the wood and frequently uttering loud notes. As I found later, a large hole entered the side of the tree just below where they were and they were evidently preparing to retire for the night. Their antics and calls were possibly meant for other distant members of the family, or possibly formed a sort of vesper service. I shot the male—a fine adult—but only wounded him, so that as he circled I gave him the other barrel, which brought him into a tree top, but only at the fourth shot did he come to the ground. Several of the no. 6 shot had struck his bill and flattened without cutting or cracking it. When he reached the ground he was still screaming angrily and his crest was thrown forward in a scarlet crown. The two other birds immediately left the vicinity and were heard calling at a distance for some time but they did not return before dark. Next morning I was at the tree before sunrise but the two birds were there before me calling for their lost leader. The deep layer of dry, dead leaves rustled under my feet and both birds flew at my approach from one tall top to another till lost in the woods.

"The stomachs of the two males killed were stuffed full of apparently nothing but large white borers [beetle larvae], one of the most destructive of the insects that vie with ax and fire in amount of timber killed in these southern forests."

Collectors of museum specimens or of the flamboyant Ivorybill crests and bills (both American Indians and white men especially valued the spectacular ivory beaks) lowered *Campephilus* populations. Habitat destruction, however, was the major cause of the species' collapse. This absurdly overspecialized bird was dependent, at least in the breeding season, on the larvae of wood boring beetles—chiefly scolytids, buprestids, and cerambycids—that live between bark and sapwood of large, recently dead limbs and trunks. Only trees dead from one to four years contain enough larvae to sustain Ivorybill populations. To insure the presence of enough trees at this stage of decay there would have to be huge forests of millions of trees. By 1918, virtually 100 percent of the lowland virgin hardwood in the South had been chopped and sawed down. The young trees that replaced the old growth had little or no food for Ivory-billed Woodpeckers. (For a detailed account of the history, through 1938, and biology of *Campephilus principalis*, see James T. Tanner's classic, *The Ivory-billed Woodpecker*, first published in 1942 and reissued in 1966.)

The Ivorybill mostly went unreported in the Lone Star State from 1906 through the 1920's. In the 1930's, however, there were sightings—chiefly by Bessie M. (Mrs. Bruce) Reid, sometimes accompanied by Corrie H. (Mrs. J. L.) Hooks—in most of the deep east Texas counties—those east of the Trinity River.

Not until the 1960's was there a big revival of Texas reports and rumors. Perhaps a few birds had wandered

in from Louisiana to take advantage of freshly drowned timber back of newly constructed dams. Between the Trinity and Neches rivers, veteran Ivorybill locator Whitney Eastman, and associates, reported two pairs and a lone female in 1960 and 1961; sightings came from the same area in 1963. In December, 1966, John Dennis, the man who rediscovered the Cuban Ivorybill just after World War II, and Manuel Armand Yramategui, experienced bird watcher in east Texas and Mexico, saw an Ivorybill near Evadale in the Neches riverbottoms of Jasper County. For the remainder of the 1960's, scores of naturalists came from all over the United States, some from as far away as Alaska. Many camped for days, weeks, or months in or near the Big Thicket in hopes of getting a photo or a sound recording of an Ivorybill. Local guides, especially Lance Rosier, were pressed into service. All over the woods, tape recorders played back Ivorybill notes—copied from the old sound film made by Arthur A. Allen and Peter Paul Kellogg in the Singer Tract of northeastern Louisiana in 1935—in an attempt to get a real live bird to answer. At the end of years of effort, there were still no unquestionable photographs or freshly made sound recordings.

By the early 1970's, Yramategui had been murdered by robbers in Houston and even the indefatigable Dennis was discouraged. The search, for the most part, shifted elsewhere. An Ivorybill feather was found in Florida in 1969, but how old was the feather? In South Carolina in 1970, an Ivorybill—or another tape recorder?—answered a taped call, but the bird was not seen. In Louisiana in 1971, two photographs—perhaps of a stuffed bird?—were made by a mysterious photographer in an undisclosed part of the state.

Meanwhile, post-1960 expeditions in Mexico in search of the Imperial Ivory-billed Woodpecker have produced increasingly negative results. It looks very much as if both of these magnificent birds have reached that horizon which the Mexicans call *más allá* (farther on)—ancient treasures receding just beyond reach.

DETAILED ACCOUNT: ONE SUBSPECIES

NORTHERN IVORY-BILLED WOODPECKER, *Campephilus principalis principalis* (Linnaeus)

No races recognized by A.O.U. check-list, 1957.

DESCRIPTION: *Adult male, nuptial plumage:* Acquired by wear from winter plumage. Upper and lower parts metallic glossy bluish black, abdomen inclining to greenish; nasal tufts yellowish white; a stripe from below ear-coverts down side of neck to mid-back white; terminal half of secondaries and terminal portion of primaries, except five or six outermost, white, this on wing-quills forming large white patch on posterior part of wing; sides of hind crown, sides of occiput, and short occipital crest scarlet red. Bill ivory white; iris lemon yellow; legs and feet light gray, larger scales lighter and somewhat yellowish; claws brownish gray or dull light brown. *Adult male, winter:* Acquired by complete postnuptial molt. Like nuptial adult male. *Adult female, nuptial:* Acquired by wear from winter. Similar to nuptial adult male, but crest (which is slimmer than male's) lacks red, this part being glossy bluish black like remainder of head. *Adult female, winter:* Acquired by complete postnuptial molt. Like nuptial adult female. *Male, first nuptial:* Acquired probably by

wear from first winter. Practically identical with nuptial adult male. *Male, first winter*: Acquired by complete postjuvenile molt. Practically same as adult male in winter. *Female, first nuptial*: Acquired by wear from first winter. Like nuptial adult female. *Female, first winter*: Acquired by complete postjuvenile molt. Practically same as nuptial adult female. *Juvenal*: Acquired by postnatal growth. Similar to adult female, but bill much shorter; crest also shorter and not pointed; outer primaries with white tips; iris dark brown. *Natal*: Unknown. Bird probably hatched unfeathered.

MEASUREMENTS: *Adult male*: Wing, 240.0–263.1 (average, 255.8) mm.; tail, 147.1–160.5 (154.2); bill (exposed culmen), 63.0–72.4 (68.3); tarsus, 42.4–46.0 (44.2); middle (outer anterior) toe without claw, 29.9–34.0 (32.3). *Adult female*: Wing, 240.0–262.1 (256.3); tail, 151.1–166.1 (159.5); bill, 61.0–67.6 (64.3); tarsus, 40.4–43.9 (42.7); middle (outer anterior) toe, 29.9–33.5 (31.8).

RANGE: *Extinct?* Identical with that of species with exception of Cuba.

TEXAS: *Resident*: (Contrary to usual practice, all records which seem valid, not just specimens, are presented herewith.) Two reports of breeding: Brazoria Co., along lower Brazos River (nest containing young found, May, 1864, H. E. Dresser); Jasper Co., along Neches River (3 eggs obtained, May 3, 1885, B. F. Goss collection). Formerly occurred (increasingly rare after 1850) north to Cooke Co., 7½ mi. south of Gainesville (seen in 1849 and 1851, Joshua Gorham); Fannin Co., Bonham (rare resident, 1890, H. F. Peters); Kaufman Co., Bois d'Arc Island, Trinity River (male specimen, about 1900, now mounted in Dallas Museum of Natural History, no. 6216, collected by W. A. Mayer); Dallas Co., bottomlands of Trinity River (1 seen, 1910, Mayer); Kaufman Co., Bois d'Arc Island, Trinity River (1

said to have been shot about 1920, J. E. Stillwell); Kaufman Co., mouth of east fork of Trinity River (1 examined by E. R. Huck, winter 1927, bird caught in trap by B. C. Hays); east to Harrison Co., about 10 mi. southeast of Marshall (seen, Mar. 12, Apr. 15, 1918, A. D. Martin); Tyler Co. (noted, Apr. 14, 1929, Bessie M. Reid); Jasper Co., along Angelina River in extreme north part of county (seen, 1934, B. M. Reid); Hardin Co., junction of Village Creek and Neches River (male and female, Nov. 1, 1933, Corrie H. Hooks, Reid); Orange Co. (recorded, 1938, Reid); southwest to Jefferson and Orange co. line, lower Neches River (seen and heard, May 19, 1937, Reid); Jefferson Co., Bunn Bluff (noted several times, 1938, prior to Oct., Reid); Liberty Co., 6 mi. east of Tarkington (2 specimens, Nov. 26, 1904, V. Bailey); Liberty Co., Tarkington Road, 4 mi. east of Cleveland (pair seen, Apr. 24, 1905, J. H. Gaut on authority of D. Billingsly); Montgomery Co. (several times met with, 1880–81, H. Nehrling); Harris Co., Spring Creek in north part of county (noted, but rare, 1880–81, H. Nehrling; 1 seen, June, 1913, Frank Schneider); Harris and Fort Bend cos., Buffalo Bayou (abundant, several taken, Apr. or May, 1837, J. J. Audubon); Brazoria Co., Brazoria (1 found freshly killed, May 29, 1927, F. C. Clarkson).

NESTING: *Nest*: In heavy forests of often inaccessible swamps or bottomlands; in large living or dead tree trunk, usually 30–50 ft. above ground; an excavation, made by the birds, with oval entrance (usually 4½–5 in. high × 3½–4 in. wide), entrance extended about 3 in. into trunk to nest cavity (depth, 1½–9 ft.); nest chamber about 8 in. in diameter; lined with small wood chips. *Eggs*: 2–6, usually 3–4; elongate to ovate to cylindrical ovate; very glossy; white, unmarked; average size, 34.8 × 25.1 mm.

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